

# *The* **'PARATUM'** **PRACTITIONER'S** **FITTED BAG**

*Ready at all times  
for immediate use*

SIZE (outside dimensions):  
Length 16", Breadth 11", Depth 5½".

**PRICE: 8 GUINEAS NETT, CARRIAGE PAID BRITISH ISLES**  
**(EXPORT PRICE: £9 POSTAGE PAID)**

*The arrangement of the contents is as follows:*

**LID.** 2 Artery Forceps  
1 Dissecting Forceps  
1 pair Scissors  
2 Stainless Knives in Sterilizable Glass Tube  
1 Tube Silkworm Gut Medium

1 Combined Electric Throat Lamp and Tongue Depressor  
1 Hypodermic Syringe in Spirit-tight Case  
1 Half Min. Magnifying Clinical

**REAR COMPARTMENT.** Seven stoppered bottles in nickel screw-capped cases, each with contents engraved outside as follows:

**CHLOROFORM**  
**TR. IODI**  
**SOL. ACID PICRIC 5%**  
**TABS. HYDRARG. PERCHLOR.**

**LYSOL**  
**METH. SPIRIT**  
**SUTURE AND HYPODERMIC**  
**NEEDLES IN ALCOHOL**

In front lies a thick glass tube with rubber cork, containing No. 8 Gum Elastic Catheter and a tube of Lubricant.

**CENTRAL COMPARTMENT.** On one side a prescription note-book with pencil and on the other a nickel-plated case with clips for tubes of hypodermic tablets. Included also in this compartment is the new REID-MORRIS stethoscope.

**FRONT COMPARTMENT.** For sundries and dressings, with lid to keep the contents in place.

2 oz. Compressed Boric Lint  
2 oz. " Plain "  
6 yds. " Gauze  
4 ozs. " Cotton Wool  
2 Compressed Bandages, 3 inch

3 Compressed Bandages, 2 inch  
4 " 1 inch  
3 yds. Adhesive Plaster 3 in. wide (in roll)  
6 Rubber Finger Stalls  
6x1 c.c. Ampoules Pituitary Principle

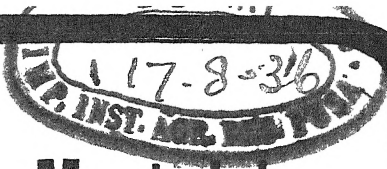
1 Sterile Throat Swab in Post Box.

The whole case is lined with glazed white waterproof material, easily cleaned with a wet sponge.

**PRICES ARE SUBJECT TO MARKET FLUCTUATIONS.**

**R. SUMNER & CO. LTD.,**  
**Surgical Instrument Makers, LIVERPOOL**





# Valentine's Meat-Juice

In all Wasting, Acute or Febrile Diseases, where the Digestive Organs are Impaired, Valentine's Meat-Juice demonstrates its Ease of Assimilation and Power to Sustain and Strengthen

## When Other Food Fails

The quickness and power with which VALENTINE'S MEAT-JUICE acts, the manner in which it adapts itself to and quiets the stomach, its agreeable taste, ease of administration and assimilation, have won for it the approval and endorsement of many medical men of Europe, America, etc.



**VALENTINE'S MEAT-JUICE CO.**  
**RICHMOND, VIRGINIA, U.S.A.**

316172



# PROGYNON-B

Oleosum



Only 3 amp.

*10,000 International Benzoate  
Units (=1,34 mg.p. amp.) each are  
sufficient to overcome*

## **CLIMACTERIC DISTURBANCES**

*even of severe character*

Full literature (and posological suggestions for  
any case of ovarian insufficiency if desired) gladly  
sent on request



SCHERING LIMITED, 188/192, HIGH HOLBORN, LONDON, W. C. 1



# AMPLIVOX

## high fidelity HEARING AIDS FOR THE DEAF

Here, at last, is a hearing aid which the medical profession can recommend with absolute confidence, for it is sold only with a guarantee of satisfaction, and gives infinitely superior results to any other instrument.

It has long been recognised that valve amplifier hearing aids give better results than other types, but they have suffered from the drawback of size and weight. The AMPLIVOX employs the new midget wireless valves and is only a fraction the size of previous valve amplifier instruments, so that there is now no need to tolerate the distortion and poor results of the ordinary electrical aid.

The quality of the amplified sound, the freedom from background noises, and the great distance at which it is possible to hear make the AMPLIVOX the most helpful hearing aid obtainable; and the joy of hearing is sustained by the great relief of strain, the splendid reliability and the low upkeep cost.

The AMPLIVOX can be recommended for all types of deafness, on account of wide frequency range, which can be modified as necessary to suit individual cases. It is especially applicable to nerve deafness.

The LANCET writes: "The apparatus gave ample volume, a quiet background, good audibility at the length of the room, and a noticeable absence of distortion; and it should be far more useful than the ordinary micro-telephone aid, and especially for use at board meetings, theatres and concerts."

*Fully descriptive Literature can be obtained from  
the Manufacturers:*

## AMPLIVOX LTD.

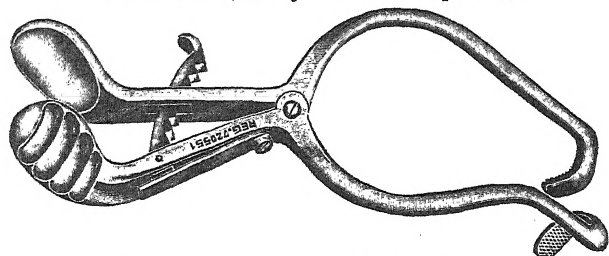
A. EDWIN STEVENS, B.A. (Oxon.), B.Sc., Governing Director

106 GEORGE ST., PORTMAN SQUARE  
LONDON, W.1

Telephone: Welbeck 4095

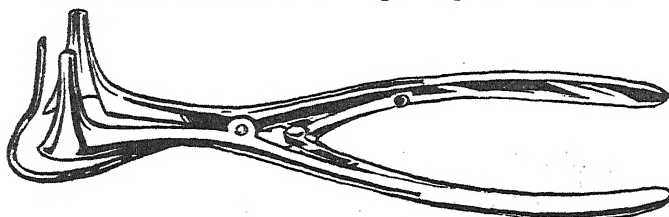
## SUMNER'S SPECIALITIES

**MOUTH GAG** with shanks and handles shaped to lie alongside of the cheek, away from the operator.



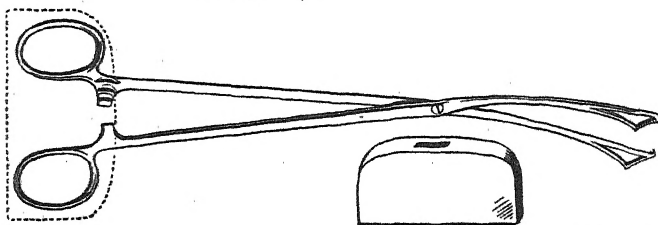
*Price, chrome-plated, £1 12 6 each*

**NASAL SPECULUM** with three blades. Spring action. Is fitted with a set-screw for regulating the dilations.



*Price, chrome-plated, 12s. 6d. each*

**PLACENTA PRAEVIA FORCEPS** (Reid's modification). A convenient weight is supplied with each instrument and fits over the bows (as dotted lines).



*Price, chrome-plated, 34s. 9d., rustless steel, 42s. 3d. each*

## R. SUMNER & CO. LTD.

40, HANOVER STREET

::

LIVERPOOL

# Sumner's Combined Instrument Cabinet and Dressing Trolley

*Size, 70 in. high, 18 in. front,  
11 in. deep.*

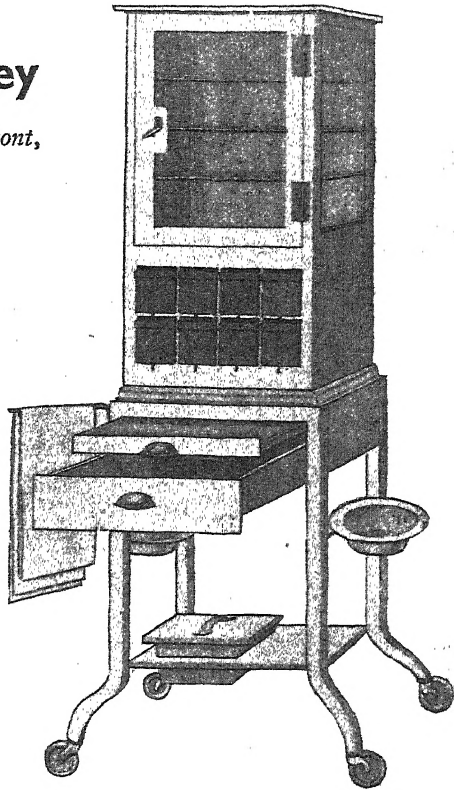
The upper portion is a well-made sheet-metal cabinet with plate-glass front and sides, and three shelves of plate-glass, below which are eight compartments fitted with strong cardboard boxes for dressings.

The lower portion has a pull-out tray fitted with plate glass for instruments, and a drawer below.

There are provided a solution bowl and tray in enamelled iron, a metal box for soiled dressings, and a towel rail.

Mounted on easy-running castors and finished in either white cellulose, or the new silver cellulose.

The hinges, lock-plate and handle, knobs, towel rail and swing fittings are chrome-plated.



**Price £10 10 0 net**

*Carriage paid in the United Kingdom*

## R. SUMNER & CO. LTD.

**SURGICAL INSTRUMENT MAKERS :: LIVERPOOL**

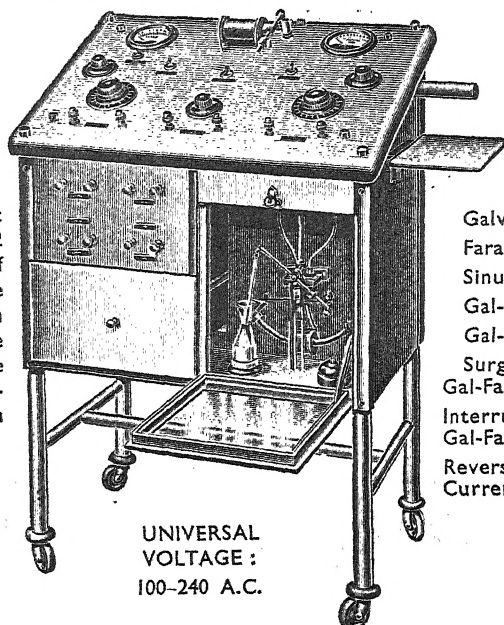
# PHYSIOTHERAPY

## APPARATUS FOR USE ON A.C. MAINS

Guaranteed "Earth-Free"

N.B.

It is important to note that 12 combinations of Currents can be obtained from this Clinic Table by means of the Special Combination Switch fitted.



UNIVERSAL  
VOLTAGE :  
100-240 A.C.

Galvanic  
Faradic  
Sinusoidal  
Gal-Far  
Gal-Sin  
Surging  
Gal-Far-Sin  
Interrupted  
Gal-Far-Sin  
Reversing  
Currents, Etc.

This Switchtable has been designed to produce true "Earth-free" Galvanism for Ionic Medication, Electrolysis, etc., Bristow Faradic for Muscle testing, and Sinusoidal current for stimulation.

The outfit is operated from the main Alternating Current without any form of motor generator, all currents being rectified by means of "Westinghouse" All-Metal Rectifiers. A patent Electro-Magnetic Surger on the Lewis Jones principle for surging any current is fitted, and this is also arranged so that it may be used as an Interrupter or Current Reverser, the same as obtained with a metronome. Any combination of current can be obtained, and, if desired, three patients may be treated at one time.

Price **£36** in Wood Cabinet ; **£40** in Metal Cabinet

Arranged for D.C. - **£5** extra.

\* WRITE FOR FULL PARTICULARS

## ELECTRO-MEDICAL SUPPLIES

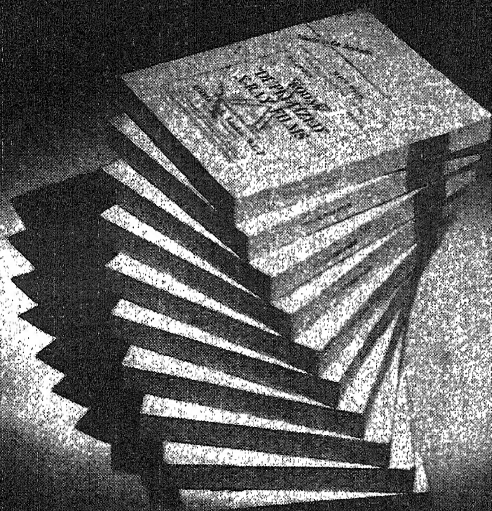
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Opposite Met. Rly. Station.

Telephones : WELBECK 3679 and 1281

*For brightness  
and speed—*



USE **KODAK**  
**SAFETY X-RAY FILM**

KODAK LIMITED  
(MEDICAL DEPT.), KINGSWAY, LONDON, W.C.2. (TELEPHONE: HOLborn 7841)

# modern X-RAY EQUIPMENT

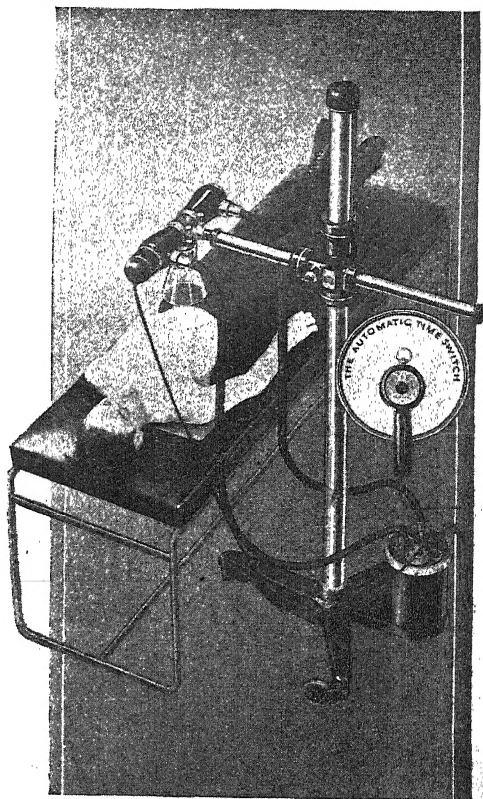
(Philips Metalix Patents)

During recent years, enormous advances have been made in the electrical efficiency of X-ray apparatus. The mobile "Sunic Junior" Outfit, illustrated here, for instance, gives brilliantly successful results, and is ideal for use in the consulting room or the cottage hospital.\*

Large hospitals are realising the improvements brought about by the introduction of the "Sunic" Roentgen Power Unit, with its remarkable X-ray efficiency and greater all-round convenience. The future will undoubtedly see the general adoption of this type of equipment, whilst the earlier non-shockproof apparatus will fall gradually into disuse.

Ask for literature dealing with apparatus suited to your needs.

\* The "Sunic" Junior Outfit is admirably suited to fracture work, and its use is advocated by Lorenz Böhler in his book "The Treatment of Fractures."



By Appointment

## WATSON & SONS (ELECTRO MEDICAL) LTD.

Manufacturers of X-ray and Electro-Medical Equipment

SUNIC HOUSE, PARKER ST., KINGSWAY, London, W.C.2

Telephone: Holborn 3881

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# DESOUTTER

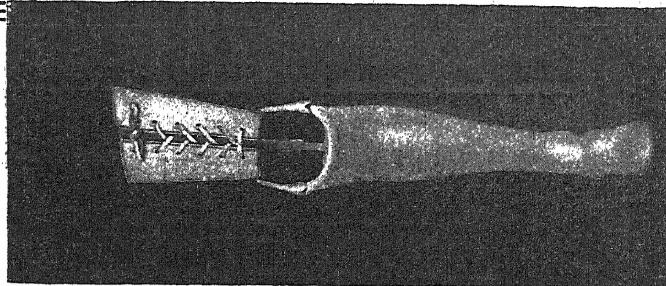
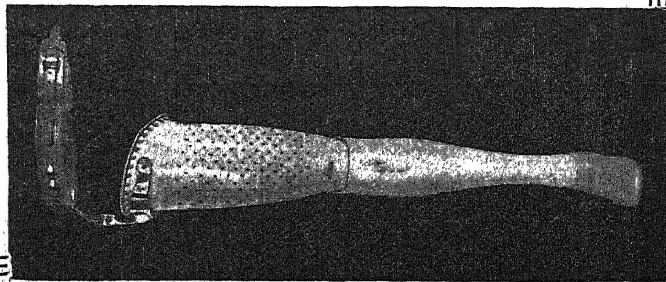
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A natural walk is the aim of every amputee. Our latest design of mechanical knee has at last made it possible for an artificial leg to swing in the same controlled manner as a natural leg. It is controlled by a conveniently placed wheel which can easily be turned through the clothing.

We have a cinematographic film which demonstrates fully, at normal speed and in slow motion, the very natural walk possible with this new limb. The film can be shown by arrangement at our Head Office.

This limb is our latest design for below-knee amputation. Constructed from seamless pressings of Alclad. The ball-bearing knee joints are internally fitted and working clearance between the patent Cushion Joint Foot and the shin is almost imperceptible. The result is a perfectly smooth outline, lightness, and great strength.

The socket for the stump is moulded from an accurately rectified cast, ensuring a glove-like fit and correct weight-bearing points.



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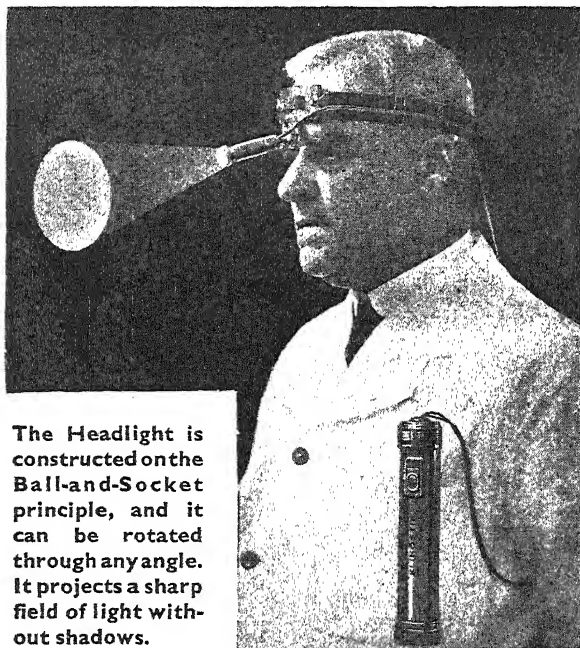
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# A New Instant-focus Multipurpose HEADLIGHT FITTED WITH OPTICAL LENS

*Klinöstik  
Regd.*

**Gives Focus Range from  
SPOT to LARGE FIELD**

*British  
Made*



The Headlight is constructed on the Ball-and-Socket principle, and it can be rotated through any angle. It projects a sharp field of light without shadows.

With battery handle **27/6** Fitted with pocket clip

Suitable for General Practitioner, Aurist, or Gynæcologist; for V.D. and other routine clinical work which demands shadow-free illumination.

*From all Surgical Instrument Makers*

**JOHN SMITH & SON (Glasgow) LTD.**

*Manufacturers of Electric Diagnostic Instruments*

**26-30 GIBSON ST., Hillhead, GLASGOW, W.2**

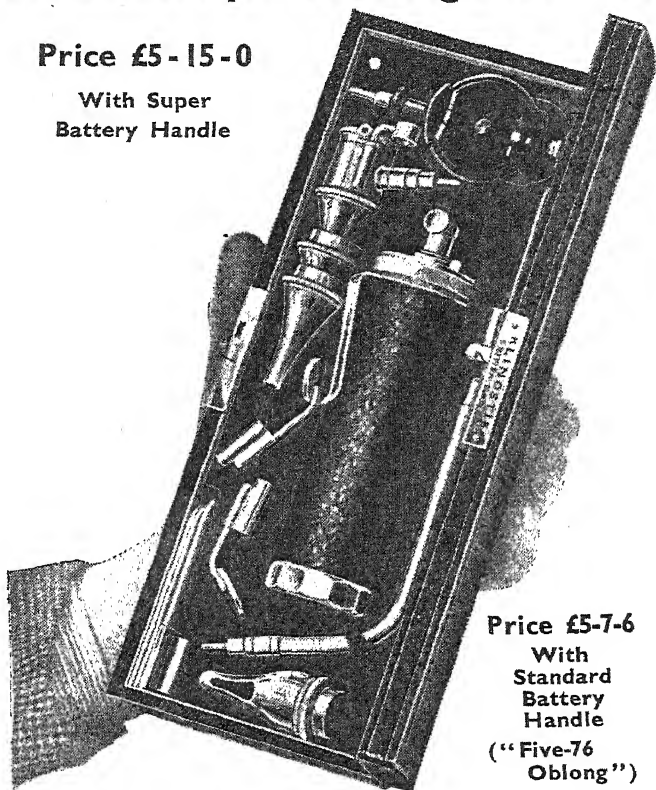
*Established 1751*

*Cable and Telegraphic Address: "Klinostik, Glasgow"*

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**Price £5-15-0**

**With Super  
Battery Handle**



**Price £5-7-6**

**With  
Standard  
Battery  
Handle  
("Five-76  
Oblong")**

May Electric Ophthalmoscope, Daylight Electric Auriscope with 3 Specula, Dilating Operating Nasal Speculum, Angled Laryngeal Rod with Lamp, Throat and Post-nasal Mirrors, Tongue Depressor and Holder for Wood Tongue Blades, Battery Handle with Rheostat. Spare Lamp

From all Surgical Instrument Makers

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*Manufacturers of Electric Diagnostic Instruments*

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"A thoroughly dependable suture possesses at least six qualities vital to correct behavior."



*D & G Sutures*

EMBODY EVERY  
SUTURE ESSENTIAL

CHAS. F. THACKRAY LTD., PARK ST., LEEDS • 252 REGENT ST., LONDON, W.1

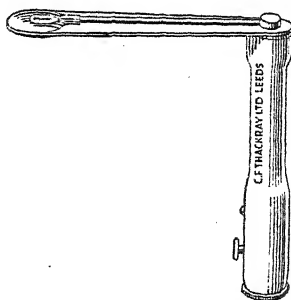
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## ELECTRIC THROAT LAMP

All Metal

Tongue Depressor and Lamp Holder detachable for sterilizing

Lamp recessed at end of Depressor which acts as Reflector



Dry Battery contained in Handle

Convenient Screw Button Switch in Handle

CHROMIUM PLATED Price 16/6 each. Spare Battery 4d. each

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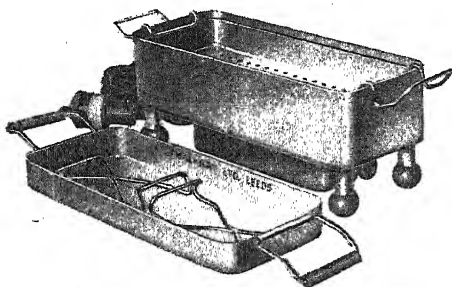
# THACKRAY'S "THERMASEPT" ELECTRIC INSTRUMENT STERILISERS

British Made Throughout

Heavy gauge copper, brazed seams. Fully protected by hand re-set automatic cut-out device. Nickel Plated finish. Suitable for use on A.C. or D.C.

Guaranteed for One Year

## MODEL "G.P."



Model "G.P."

Fitted with drop-over lid. Each Steriliser complete with perforated tray with self-supporting handles (method of use as illustration), and lift-out hooks; 6 feet flex and patent lampsocket, 2-pin plug adaptor. Clamp on heater providing rapid boiling.

### PRICES:

			£	s.	d.
Size No. 1	8 in. × 4 in. × 3 in.	..	2	13	6
*Size No. 2	10 in. × 4 in. × 2½ in.	..	2	15	0
Size No. 3	9 in. × 5 in. × 3 in.	..	3	0	0
Size No. 4	11 in. × 5½ in. × 3 in.	..	3	8	6
Midwifery Model,	size 16 × 4 × 3½ in.	..	3	15	0
Carrying Case 15/- extra					

\*No. 2 size is especially suitable for general use for sterilising Record Syringes and diagnostic instruments.

*STATE VOLTAGE when ordering*

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Telephone 20085  
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*Thackray*  
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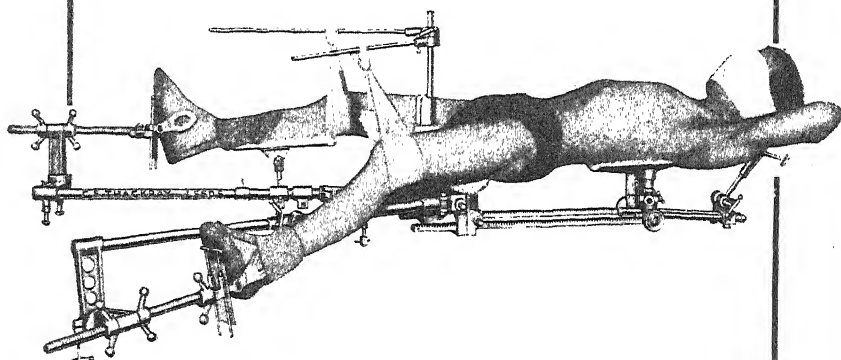
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Equipment, and Surgical Appliances.

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A THACKRAY SPECIALITY

# A NEW IMPROVED PORTABLE ORTHOPÆDIC APPARATUS



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Hon. Surgeon, ROYAL HOSPITAL, PORTSMOUTH

*Descriptive Circular and Catalogue of Splints  
and Orthopædic Appliances on application*

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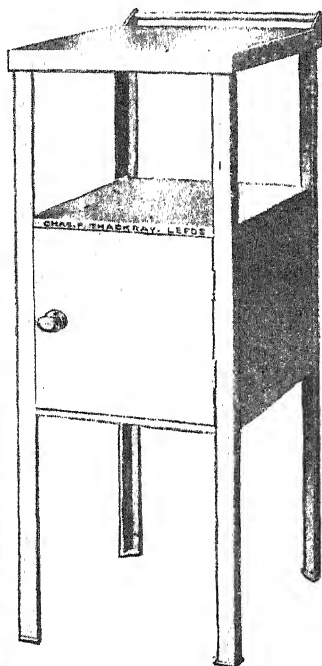
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# The "COLONIAL" ALL STEEL WARD LOCKER



**Strong and light, with Art finish  
in Pastel Green**

Made throughout of heavy gauge pressed sheet steel, specially treated to resist the effects of corrosion and climatic conditions. Pressed sheet steel enhances the strength, and angled steel uprights with turned in feet ensure stability. Shelf at top, cupboard below, with strongly hinged door and closing handle. 12 in. Towel Rail at back.

*Can be completely taken apart for shipping, as the top, cupboard, and uprights are rapidly dissembled or assembled, thus reducing freight charges.*

**CLEANLINESS.** Easily kept clean with a damp cloth.

**FINISH.** Stoved on undercoat and finished Cellulose enamel to give smooth clean surface in the following colours:—White, Silver Grey, Pastel Green (Standard Shade).

## MEASUREMENTS:

Top size 14 ins.  $\times$  15 ins.  $\times$  34 ins. high (35½  $\times$  38  $\times$  86 cms.)  
Cupboard size 10½ ins.  $\times$  10½ ins.  $\times$  10½ ins. (26½  $\times$  26½  $\times$  26½ cms.)  
Shelf. Depth from Top 9½ ins. (24 cms.)

			£	s.	d.
PRICE (Ex Works) Packing extra .. ..	each	2	15	0	
In lots of 25 (all one colour) .. ..	each	2	10	0	
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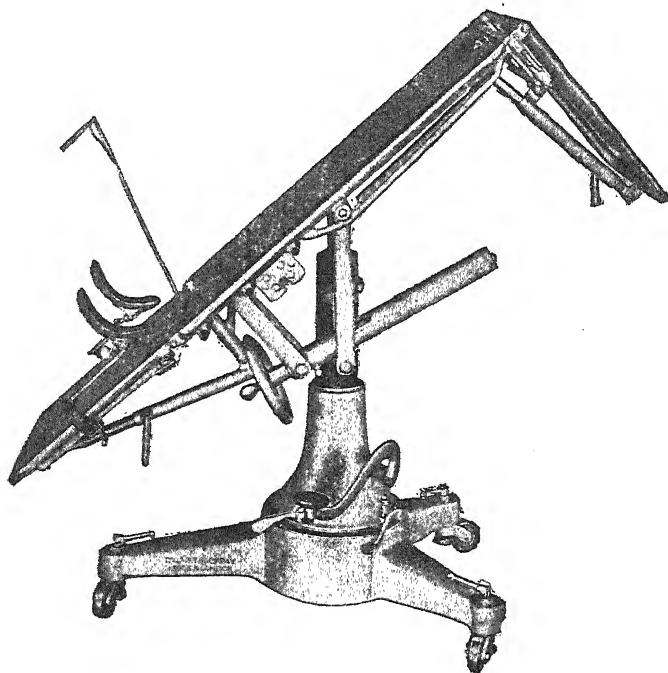
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Improved Universal Model  
on Oil Pump Base

*BRITISH MADE THROUGHOUT.*



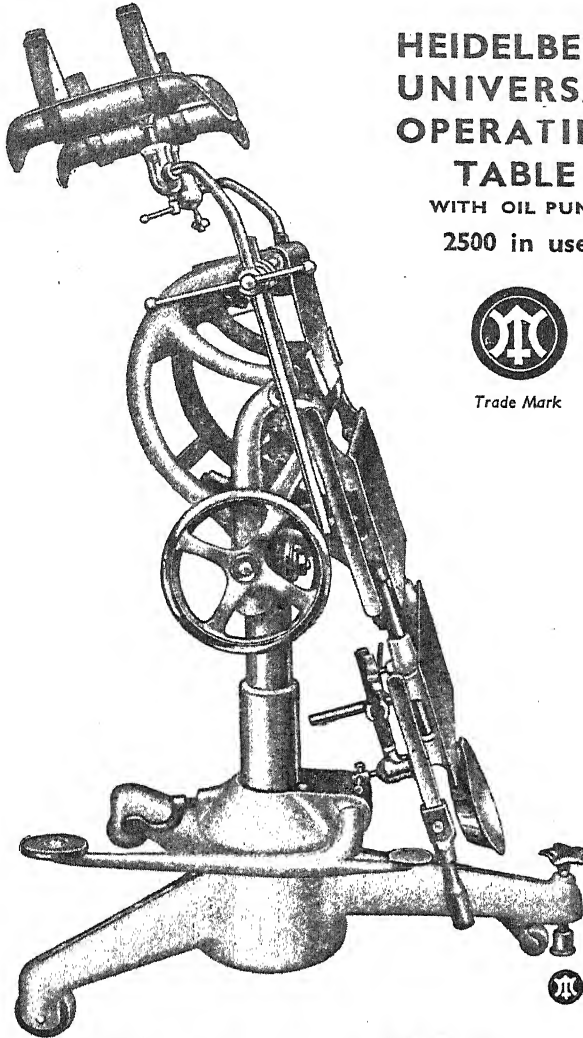
Descriptive Booklet, "MODERN OPERATION TABLES,"  
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# HEIDELBERG UNIVERSAL OPERATING TABLE

WITH OIL PUMP

2500 in use



Trade Mark

ASK FOR THE FAMOUS  
**MAQUET**  
HOSPITAL FURNITURE

and Operating Tables for every position  
required and for every special purpose

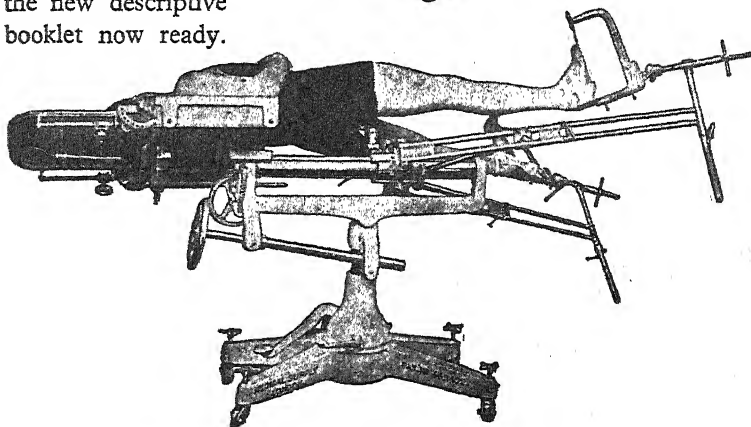
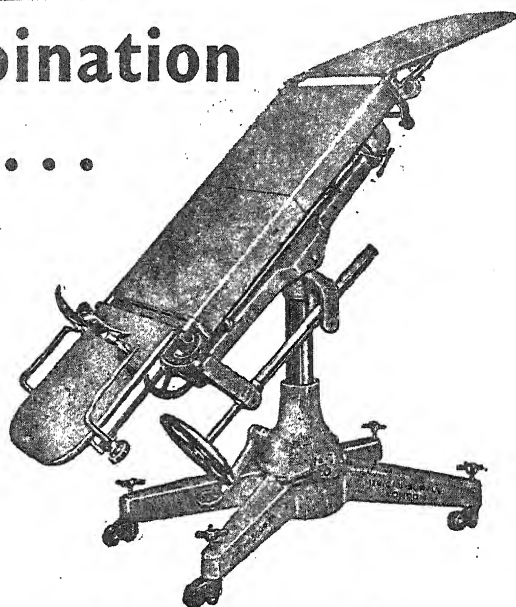
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UNITED FACTORIES C. MAQUET, RASTATT 10, BADEN, GERMANY  
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# A Combination Table . . . .

## OPERATION AND ORTHOPÆDIC

This new Emesay product serves the double purpose outlined above, and Hospital Authorities considering the installation of a new table are invited to write for a copy of the new descriptive booklet now ready.



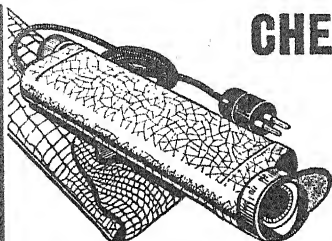
Write for New Catalogue of Sterilizing, Theatre, and General Hospital Equipment.

*The*  
**MEDICAL SUPPLY**  
*Association Limited*



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Check your diagnosis by the evidence of the eye—by a routine examination of the fundus with the

**EMESAY REFLEXLESS**

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A new instrument which entirely eliminates any corneal reflex and ensures a perfect image even through a small pupil. Such routine examination will often establish the existence of disease before other symptoms are apparent. This new ophthalmoscope allows the easy examination of recumbent patients.

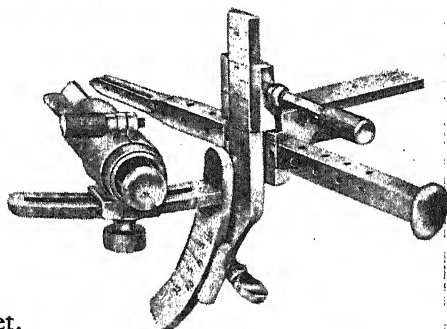
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*Described by Eric Lloyd in  
"The Lancet," July 20, 1935*

- Wire Guides dispensed with.
- Technique simplified:
- Accuracy assured



Write for special Leaflet.

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**MEDICAL SUPPLY**  
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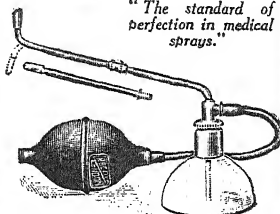
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# ROGERS' Standard SPRAYS

Have a **WORLD-WIDE REPUTATION**  
for **Efficiency and Reliability.**

They are made in many forms, scientifically designed for  
**NASAL, PHARYNGEAL, POST-NASAL**  
**AND LARYNGEAL TREATMENT**

"The standard of  
perfection in medical  
sprays."



**Rogers'**  
(Adaptable)

## AQUOLIC ATOMIZER

for nose or throat without alteration.

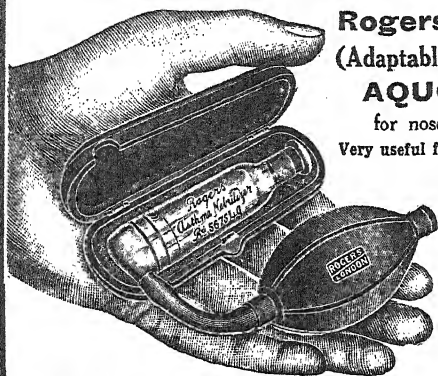
Very useful for laryngeal and post nasal treatment.

## Rogers' ASTHMA NEBULIZER

for oils or balsamic solutions.

Produces the finest vapour for  
inhalation.

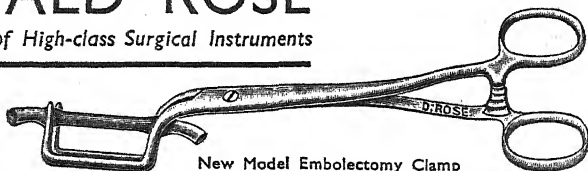
Particulars of these and many other reliable  
spray producers gladly supplied by the  
sole maker—



**FRANK A. ROGERS, 1, Beaumont St., LONDON, W.1**

# DONALD ROSE

Manufacturer of High-class Surgical Instruments



New Model Embolectomy Clamp  
Stainless. As made for Westminster Hospital.

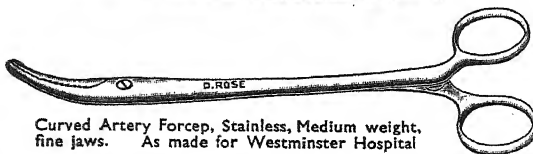
Mastoid Gouges, made in  
four sizes. Suggested by  
E. Carew-Shaw.



Double-ended Tonsil Dissector  
Stainless. Suggested by E. Carew-Shaw.



Mastoid Gouge, Hand-forged,  
Stainless, made in six sizes.



Curved Artery Forcep, Stainless, Medium weight,  
fine jaws. As made for Westminster Hospital

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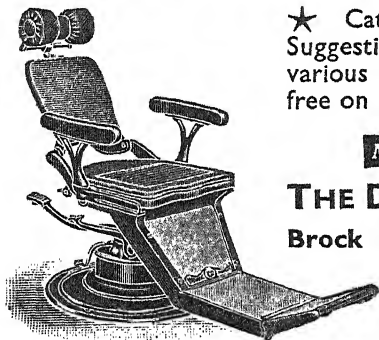
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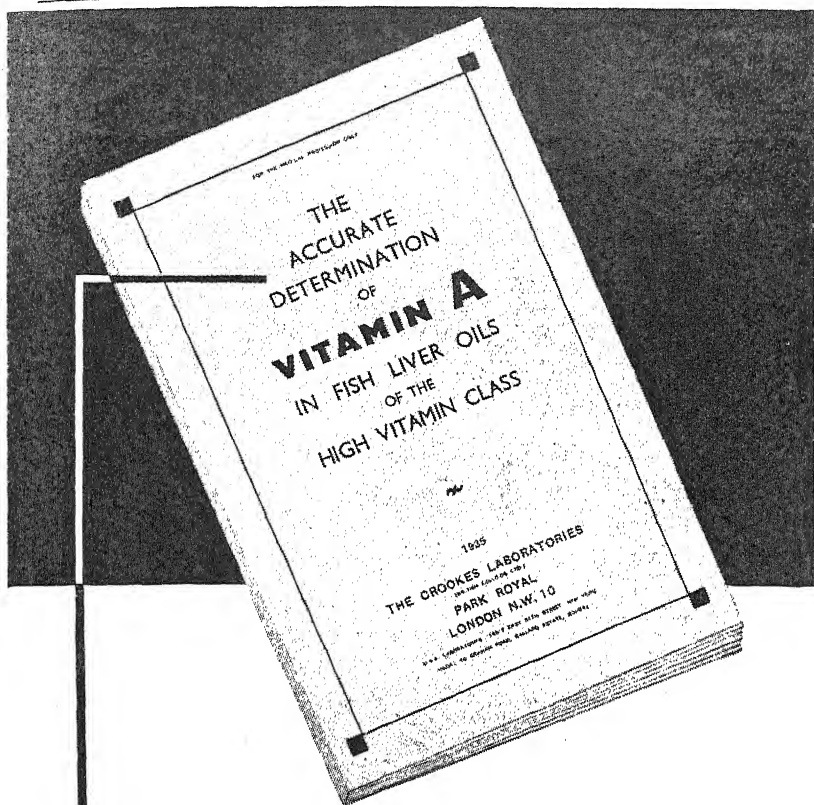
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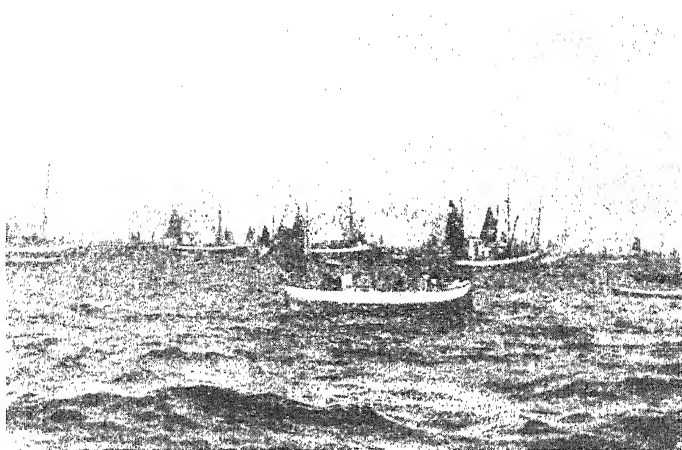
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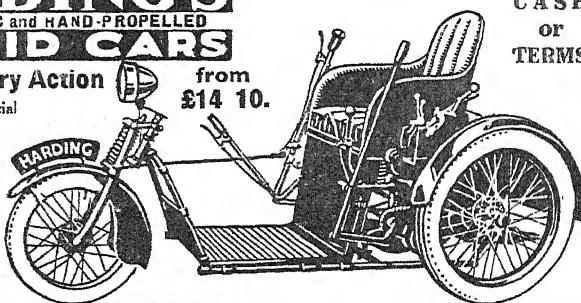
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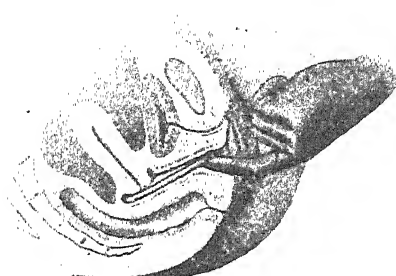
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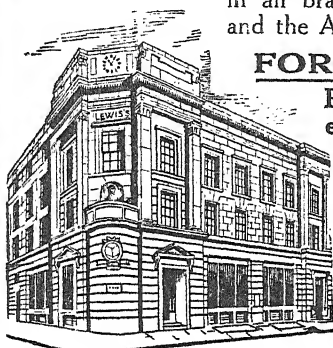
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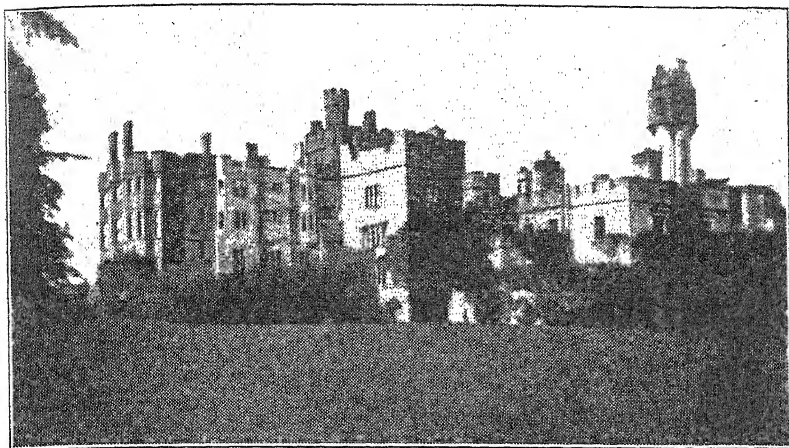
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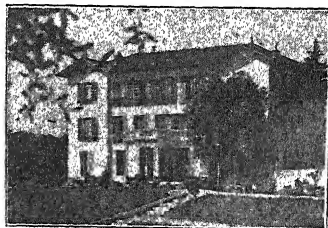
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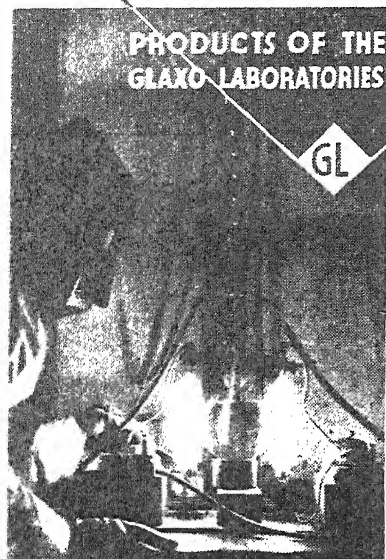
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# THE MEDICAL ANNUAL, 1936

## *A Review of the Year's Work in the Treatment of Disease*

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### INTRODUCTION

BY THE EDITORS

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A TEXT-BOOK of medicine, said Osler, must not be a year-book. A text-book must state views which have stood the test of time, or at least have received widespread support and little opposition. For treatment it must not record a long list of drugs for the value of which there is only shadowy evidence. A practitioner who turns to a text-book should be able to find some definite and reasonable line of treatment if such exists, or a statement of its absence if this be the position. A text-book should be so framed that a reader can accept its statements without unduly employing his own judgement.

But Osler was not speaking in a derogatory sense of year-books. He was indicating that their functions differ from those of text-books. A year-book must record the proceedings of the previous year like the minutes of a meeting. Minutes contain no implication that the opinions expressed by the speakers are justified or that the conclusions arrived at are correct, although some discretion is used as to what is inserted. The next meeting may produce further evidence for consideration and reverse the previous decisions.

The fate of the matter recorded in our year-book varies greatly. Some new discovery may be accepted instantly. Within two years of Minot and Murphy's original work, it would have been useless for anyone to publish an article simply to support the 'liver diet' for pernicious anæmia. In other subjects we watch from year to year a slow increase in knowledge, such as in the treatment of tetanus with curare. The clinical material and the remedies are not in everyone's hands. There may be nothing to record for a year, but each article marks an advance. In other subjects again year by year there appears to be merely a repetition without conviction. The articles in 1925 on the treatment of pernicious anæmia might equally well have been written in 1900. On the treatment of leukæmia or the curative value of vaccines, and on many other subjects, we read now the same articles as we did in 1910. The key is somewhere lacking.

The MEDICAL ANNUAL for 1936 presents the minutes of the proceedings for 1935. They are as accurate an account of what took place as the recorders can make them. Many questions will arise from reading them. Some, perhaps, may be solved in 1936, while others will defeat our successors.

## MEDICINE

**SCHOOL MEDICAL SERVICE.**—It is in the highest degree important to the nation that its children should be healthy. Children suffer from many defects, such as dental and ocular, which may not be observed even by a reasonably careful mother, but which can be remedied by medical care. Attention was directed to this towards the end of the nineteenth century by the realization that many children, owing to physical defects, failed to obtain the full benefit of the education which had recently become compulsory. School Medical Officers began to be appointed by the Local Education Authorities, and at first had to cope with an enormous mass of arrears and some opposition. Gradually there has evolved the present School Medical Service linked up with Maternity and Child Welfare Service and other Social Services. The work could be better done by family doctors, who would have the advantage of the personal friendship of the child and the family, but to a considerable extent the family doctor would not be given the necessary opportunity. The special article on the School Medical Service by an experienced medical officer of the Board of Education gives a welcome account of its origin and activities.

**ATHLETES AND DIET.**—The correct diet for athletes in training is a matter concerning which the medical profession is rarely consulted. A team of athletes are young men under the control of some senior who is often entirely ignorant of all principles of dietetics. Many of us must have been in training at some time and can remember the monotonous, ill-balanced boil-bringing diet which we consumed under injunctions. Matters have somewhat improved, but the old traditions still linger. A summary is given of an article by a physician of exceptional experience in the training of athletes.

**BRONCHIECTASIS.**—Surgical procedure is advancing rapidly in the treatment of bronchiectasis, and the mortality of lobectomy has fallen from 80 per cent ten years ago to about 14 per cent to-day. The proper selection of cases and their adequate pre-operative treatment must not be overlooked, and the co-operation of the physician and surgeon is essential. This also applies to other conditions in which thoracic surgery is becoming a practical method of treatment.

**DISORDERS OF THE BLOOD.**—Knowledge of blood conditions still continues to advance in important directions.

Hæmophilia, though a rare disease, has always attracted the special interest of the lay public. It is a tragic experience to watch a hæmophilic slowly oozing to death from some inaccessible site in the nasal mucous

membrane. Hitherto blood transfusion has been our only specific method of treatment. This undoubtedly reduces temporarily the length of the coagulation time of the blood, but it may still leave it so prolonged that the hæmorrhage continues. MacFarlane and Burgess have now introduced the use of snake venom as a local coagulant. It has long been known that the venom of certain snakes is anti-coagulant and the venom of other snakes coagulant to blood. MacFarlane and Burgess find that the venom of Russell's viper is highly coagulant and is locally effective in checking hæmophilic oozing. This is a discovery of the highest importance. There is some evidence that it will check hæmorrhages in other circumstances.

The study of megalocytic anæmia has been further clarified by Wilkinson by the separation of achrestic anæmia, in which the defect is in the storage mechanism of the liver.

An extensive study of anæmia among a working-class population in Aberdeen has recently been carried out by a team of workers, and illustrates the relations between wages, diet, and anæmia.

**THE GALL-BLADDER AND HEART DISEASE.**—The connection between gall-bladder disease and heart disease has recently attracted considerable attention. It is now recognized that gall-bladder disease may closely simulate angina, but there is also evidence that it may aggravate heart disease, especially disease of the coronary arteries. Many heart cases have lost their cardiac manifestations after operation on the gall-bladder, but this is not invariably so, and it must not be promised that this will necessarily follow. In some cases the electrocardiogram has been normal throughout, in others an abnormality has disappeared after operation, while in some it has persisted, no doubt owing to simultaneous disease at both sites. Further study is called for. The subject is dealt with in the review on heart disease.

**INTESTINAL WORMS IN CHILDREN.**—The treatment of intestinal parasites in children is constantly before the general practitioner. Mothers are always very anxious at their presence, but usually believe that a bottle of medicine or an enema will rapidly get rid of them completely. More commonly the child's general health, diet, and surroundings need as much attention as the contents of the colon.

**MALARIA.**—Malaria is undoubtedly the most widely spread disease in the world, and must continue to be the outstanding problem of health in affected zones. The recent exceptional epidemic in Ceylon led to a death rate which caused considerable criticism. It is now known that the local medical service was aware that an epidemic was inevitable when the south-west monsoon rains failed, but had no facilities to prevent it or to cope with it immediately it developed.

The relative value of atebirin and quinine is still being investigated, and new compounds such as atebirin musonate are being tested. Numerous other problems of malaria are referred to by the reviewer.

**NEUROSES OF WAR.**—The question of neuroses was a serious problem during the War, and a cause of friction between military authorities and psychological experts. But it became accepted that a physically healthy man might be reduced by neurosis to a condition in which his military value was nil. The Ex-Services Welfare Society recently held a Conference on the persisting effects of war neuroses. The passage of time has thrown a clearer light on some of the questions which caused differences of opinions during the War between the doctors and soldiers, and also on some of the problems which arose when the financial value of disabilities had to be evaluated by the Ministry of Pensions.

**THE PITUITARY GLAND.**—The advance of knowledge of the functions of the pituitary gland has led to the view that it is the driver of the team of internal secretory glands. More and more functions have been discovered for the anterior pituitary and each has been ascribed to a separate hormone. Now a revulsion of feeling has taken place and authorities are inclined to view the action of the anterior pituitary as a whole rather than as a series of unrelated hormones.

**PNEUMOCOCCAL SERUM.**—The early claims for the results of pneumococcal serum in acute pneumonia were scarcely supported by fuller examination, but the value of the serum in Type 1 infections is now established beyond doubt. The difficulties of typing and of the expense of the serum have not yet been completely overcome. An extensive report has been published during the past year and is summarized by the reviewer.

## SURGERY

**GENERAL SURGERY.**—It has been said that however surgery may progress in the future, it is not likely to be in the way of bigger operations, but reference is made to successful cases of amputation of the leg with part of the innominate bone with the aid of blood transfusions and nerve blocking. A method of arteriography for the limbs, useful in cases of senile gangrene, is described. Injections of hypertonic salt solution appear to check thrombo-angiitis obliterans. A treatment for burns with a dressing of tannic acid and dettol is well spoken of. Secondary parotitis clears up well on treatment with Lugol's iodine. Attention is called to the frequency with which suppurative pericarditis is overlooked, and a method of drainage is described. Salivary fistula may be treated by drying up the secretion of the parotid gland by X rays for a time. It is pointed out that persistent pain in the arm and hand is often due to pressure of the scalenus anticus on the brachial plexus; the condition may be incorrectly diagnosed as cervical rib; division of the muscle gives relief. The opinion is expressed that skin-grafts taken from another person are invariably a failure. Total thyroidectomy is again well spoken of for the relief of certain cases of angina pectoris and congestive heart failure. In the treatment of cellulitis and other septic conditions, more and more reliance is being placed on absolute

rest with pressure-bandages or plaster-of-Paris. The healing of chronic sores is said to be greatly expedited by a dressing of cod-liver oil, and of bed-sores by elastoplast.

**THE BREAST.**—Chronic interstitial mastitis in patients under forty may well be treated with X rays. Ovarian extract may be given by mouth or hypodermically.

**ABDOMINAL SURGERY.**—Attacks of arterial hypertension may be due to a tumour of the medulla of the suprarenal gland, removal of which gives very good results. When a gall-stone is left lodged in the ampulla of Vater, it may be dissolved by injecting ether through the drainage tube in the common duct. A writer comments on the cases of sudden collapse and death a few hours after deflation in cases of acute intestinal obstruction, and discusses pathology and prevention. Opinion on the Continent seems to be steadily setting in favour of medical rather than surgical treatment in cases of acute pancreatitis. Cancer of the head of the pancreas has been made to disappear by radium needling. The review of the results of a collective investigation on the subject of gastrojejunal ulcer is well worth perusal; the condition is very serious; probably a partial gastrectomy is the best treatment. In cases of irremovable cancer of the pylorus, an exclusion operation gives greater relief than gastro-enterostomy.

**DISEASES OF THE BONES AND JOINTS.**—In the section on bone surgery there is a valuable review of the difficult subject of bone tumours; amputation or excision, followed by irradiation of the stump and of the chest, is recommended, with or without Coley's fluid. Another useful article deals with painful feet; there is a common variety, often missed, in which wrenching of the foot promptly cures. Persistent pain from fractured carpal scaphoid may be relieved by drilling the bone to obtain a better blood-supply, and refreshing the fractured surfaces. Opinion has changed as to the causation of paraplegia in cases of spinal caries; it is usually due to interference with the blood-supply of the cord; sometimes there are tracking abscesses, and occasionally partial dislocation with bony pressure; drainage of an abscess is better obtained by costo-transversectomy than by laminectomy. For osteo-arthritis of the hip, in early cases, manipulation is advised; for later cases, a walking plaster spica. For flail shoulder, the choice lies between arthrodesis and muscle transplantation.

**MANIPULATIVE SURGERY.**—We include, for the first time, a long special article on this subject, with a careful discussion on the choice of suitable cases.

**CHEST SURGERY.**—Chest surgery becomes more ambitious, and even total removal of one lung is now quite practicable, or the root may be ligatured and the lung left to slough off. Certain cases of new growth of the lung respond well to radiation.

**SURGICAL AILMENTS OF CHILDREN.**—The reviewer of surgical ailments in children points out that practically all cases of empyema require aspiration as a first treatment; thoracotomy is reserved for the patients with a localized collection of pus. A school of opinion is arising which teaches that acute osteomyelitis should not be operated on. More exact study shows that the term "congenital hypertrophy of the pylorus" is a misnomer; it is not the pyloric muscle that is hypertrophied but that of the prepyloric part of the stomach; there are extraordinary differences in the operation mortality in different clinics, as though the type of disease treated were not always the same. A treatment with pituitary extract, which may be isolated from the urine of pregnant women, sometimes gives remarkable results in cases of undescended testis.

**DISEASES OF THE RECTUM.**—In the article on diseases of the rectum, we are informed that a new substance for the injection treatment of pruritus and of anal fissure has been introduced called 'proctocaine'; it has the advantage over A.B.A. that it causes less pain. At operation for anal fissure it is no longer considered necessary to cut into the sphincter; it is sufficient to stretch it and to excise the fissure. It now appears that anal fistulae are often lined with epithelium derived from intramuscular glands; it is therefore not enough to lay them open; they must be excised. Diaphragm strictures of the rectum are treated by internal proctotomy followed by dilatation; for tunnel strictures a new operation is described, in which a longitudinal incision into the bowel is sewn up transversely.

**SURGERY OF THE CENTRAL NERVOUS SYSTEM.**—Operative treatment of abscesses of the brain must be accurately timed to obtain success; it must not be too early or too late; excision, when possible, is better than drainage. Facial nerve paralysis is best treated by repairing the nerve or grafting it with a piece of cutaneous nerve that has already undergone Wallerian degeneration; this can be done even in the bony canal; if the nerve is beyond repair, the symmetry of the face may be restored with the aid of strips of fascia lata. It is now recognized that a succession of epileptic fits may be due in certain patients to cerebral tumour without any of the classical signs thereof being present, and especially to a meningioma. Sharp pain referred along a spinal nerve root when a patient coughs or strains is a symptom suggestive of a posterior-root neurofibroma. Cases of paraplegia with retention of urine are apparently best treated without the catheter, unless they get bladder discomfort; the bladder is allowed to fill till it overflows, or it may be emptied by regular manual pressure. Certain cases of pressure on the spinal cord are due to protrusion backwards of the nucleus pulposus of the intervertebral discs; low backache is, as a rule, the most prominent symptom; removal by operation is indicated.

**GENITO-URINARY SURGERY.**—In the review of genito-urinary diseases it is mentioned that a case of Addison's disease was relieved by adrenal grafting. There is a variety of frequency of micturition in women,

without cystitis, which responds well to instillations of silver nitrate. As mentioned last year, for extensive carcinoma of the bladder total cystectomy is coming into favour; the ureters may be diverted by skin-implantation and catheters tied in permanently to keep the patient dry. Radium, unfortunately, is not very successful for treatment of epithelioma of the penis. The urine, or, better still, the hydrocele fluid, of most cases of malignant testis gives a positive Zondek-Aschheim reaction in mice, and if the test becomes positive again after removal of the tumour, it has probably recurred. An operation is described in which the gracilis muscle is used to make a new sphincter in cases of incontinence of urine. A very promising method of treatment for *B. coli* pyuria appears to be the administration of mandelic acid.

**VENEREAL DISEASES.**—Those interested in venereal diseases will find an account of a remarkable method of treatment for gonorrhœa by 'roasting' the patient in a special chamber, or, in females, by pelvic diathermy. One author advocates epididymectomy for gonorrhœal epididymitis. There is a discussion of measures to prevent the spread of vulvo-vaginitis in homes for children. It appears that 30 per cent of female patients with gonorrhœa also have an infection of the rectum, which calls for treatment. Evidence is accumulating that the unfamiliar disease lymphogranuloma inguinale, mentioned in this preface last year, is really not uncommon. [A case of my own, in the pre-suppurative stage, responded excellently to radium.—A. R. S.] Evidence is also accumulating that syphilitic infection without a primary chancre is not very rare. A very interesting comparison is given of the prognosis of treated and untreated syphilis. The 'roasting' treatment referred to above appears to be curative for interstitial keratitis.

**DISEASES OF THE EAR, NOSE, AND THROAT.**—Any help in dealing with such an unpromising complaint as deafness due to otosclerosis is very welcome, and a plan of treatment with thyroxine, injected locally, is described. An operative technique for drainage of the ethmoidal and frontal sinuses is referred to, but a warning is given against meddling surgery in not-severe cases; in children, alkaline douches and argyrol are very useful, with puncture and lavage of the antrum. Diathermy of the tonsils comes in for vigorous criticism; it is insinuated that the instrument maker, anxious to create a market for his goods, has had a hand in extolling the virtues of the treatment.

**OPHTHALMIC SURGERY.**—Eye surgeons should take precautions before operating for cataract to be sure that the patient is not sensitive to lens-protein, or a severe iritis may follow enucleation. A variety of conjunctivitis caught in swimming-baths is discussed. A method of cleansing the conjunctival sac before operations by means of ultra-violet light is mentioned. Corneal opacities may be improved by the application of quinine. In cases of acute glaucoma relief may be obtained by retrobulbar injections of novocain-adrenalin, or by intravenous hypertonic saline. In a few cases with embolism of the central artery of the retina,

the embolus has been shifted to a less important area by injecting acetylcholine beneath the conjunctiva. Sodium nitrite often improves a tobacco amblyopia.

**OBSTETRICS AND GYNÆCOLOGY.**—It is not often nowadays that a good new method of obstetric delivery is introduced, but an author brings forward what appears to be a valuable procedure in delivering a breech. An interesting medico-legal discussion as to the justifiability of sterilization is reported. A new method of diagnosis, called cysto-diaphanoscopy, is illustrated. The value of X-ray examination in antenatal work is referred to below.

**CANCER.**—The radium bomb, carrying a massive dose, was not at first very successful in this country, but recently it has been found of great value in the treatment of certain cases of cancer of the larynx, pharynx, metastatic glands of neck, and bone sarcoma. A method of using radium for cancer of the rectum is explained.

**RADIOLOGY.**—Advances are recorded in the X-ray elucidation of diseases of the heart. The importance of having a skiagram after accidents is emphasized by a case in which the door handle of a motor-car was found quite unexpectedly in a boy's chest. Now that portable X-ray apparatus is readily available, the opinion is expressed that every patient with an 'acute abdomen' should have a radiological examination; it may yield most valuable information; for instance, it will show a basal pneumonia, which may simulate appendicitis, before it produces the ordinary clinical signs in the chest. Antenatal radiography, also, can be very helpful: it will reveal the presentation, placenta prævia, the relative size of the maternal pelvis and foetal head, etc. The condition of traumatic osteoporosis, referred to last year, is again discussed. X-ray treatment of fibroids is nowadays very successful.

**ANÆSTHETICS.**—Perhaps the most promising of the new anæsthetics is cyclopropane. A subject which has occupied attention during the year is the danger of explosions due to anæsthetic vapour; some necessary precautions are suggested. Rectal paraldehyde or avertin as a pre-anæsthetic medication for children is praised. Eviphan has come to stay, at any rate until a better equivalent is found.

As one looks through the material gleaned by our contributors from another year's medical literature, an outstanding impression is that there have emerged an unusually large number of comparatively simple methods of new treatment, for a great diversity of ailments, well worthy of the attention of every practitioner who desires to relieve his patients safely, quickly, and pleasantly.



## DICTIONARY OF PRACTICAL MEDICINE

### ABDOMINAL PAIN IN CHILDREN. *John Fraser, Ch.M., F.R.C.S.Ed.*

A. Rendle Short<sup>1</sup> draws attention to the all too prevalent fallacy that when a child complains of abdominal pain there must have been some indiscretion in diet, and that therefore the appropriate remedy is a dose of aperient medicine. There is a true and tragic significance in his words, "the routine use of an aperient in such cases kills hundreds of children every year in this country".

Considering the question on a general basis, Professor Short recognizes the significance of two questions: Is diarrhoea present or absent? and, Is the child over or under five years of age? The case of abdominal pain associated with diarrhoea is not considered in any detail, for the reason that, with the exception of pneumococcal peritonitis, the syndrome is unlikely to have a surgical significance. Proceeding to discuss cases of abdominal pain without diarrhoea, he recommends that particular note should be taken of the age incidence. In the first group—that of cases below the age of five years—he places two relatively common conditions productive of abdominal pain—intussusception and the colic associated with ileocolitis, and he has many interesting things to say regarding the differential diagnosis between these two diseases. Of rarer occurrence in this group he mentions Henoch's purpura and acute intestinal obstruction from causes other than intussusception.

The peculiar value of this paper, however, lies in the description of the causes of abdominal pain in children older than five years. In this class the author discusses a number of conditions—appendicitis, pneumococcal peritonitis, pneumonia, influenza, inflamed mesenteric glands, abdominal tuberculosis, spinal disease, and muscular strain. He lays particular stress on the fact that indiscretions of diet are rarely the cause of abdominal pain, and that no aperient medicine should be given if there is the least suspicion of a local inflammatory lesion.

REFERENCE.—<sup>1</sup>*Brit. Med. Jour.* 1935, i, June 8, 1157.

### ABDOMINAL SURGERY, MISCELLANEOUS.

*A. Rendle Short, M.D., F.R.C.S.*

**The Lateral Abdominal Incision.**—For all surgical procedures in the right or left side of the abdomen, or for pelvic operations, H. Costantini and R. Marill<sup>1</sup> advise an enlarged and modified McBurney incision, which avoids division of nerves, muscles, and vessels, and gives good exposure. They start at the lowest point of the ninth or tenth costal cartilage and curves downwards and inwards to reach the middle line two-thirds of the distance from the umbilicus to the pubes. The external oblique is then split from the top of the incision as far as the fusion with the anterior sheath of the rectus. The internal oblique and transversalis are then split in the line of their fibres, and the anterior sheath of the rectus is cut transversely to the mid-line. The rectus can then be retracted inwards. (*Plate I.*)

**Burst-open Abdominal Incisions.**—The tale of woe from New York referred to last year is now continued from New Orleans, where U. Maes,

F. F. Boyce, and E. M. McFetridge<sup>2</sup> report 44 cases of post-operative evisceration. They comment on the fact that no English surgeons seem to write on the subject. Of the 44 cases, 13 died, but some of them were already very ill before the catastrophe. All kinds of operations contributed; the patients were not usually suffering from malignant disease; in fact most of them had appendicitis. Six of the cases followed the McBurney incision. All the primary incisions had been closed in layers, usually with catgut. In more than half, the sutures had been removed before rupture occurred, and often this removal was too early. They agree with Freeman that the most frequent cause is insinuation of omentum between the edges of the peritoneal closure.

**Splanchnic Anæsthesia.**—H. Finsterer, of Vienna, and P. Thorek<sup>3</sup> refer to the dangers of high spinal anæsthesia, such as is necessary for upper-abdomen surgery, and of paravertebral anæsthesia, which needs 12 to 18 punctures and introduces a large dose of novocain. In 5895 cases of splanchnic anæsthesia by the Kappis technique (dorsal route) the mortality was 1 in 1474. Finsterer used the anterior approach, Braun's method; there were 2 fatalities in 10,000 cases, one being due to grave overdosing. The needle is inserted through the open abdominal cavity on to the anterior surface of the 12th dorsal vertebra between the aorta and inferior vena cava; in stout patients or in the presence of adhesions a little gas or ether may be necessary to place the injection painlessly. A  $\frac{1}{2}$  to  $\frac{1}{4}$  per cent solution of novocain is used, and 70 c.c. is usually enough. A little adrenalin is added. The abdomen is opened under a local anæsthetic, the stomach drawn down, and the hepatic artery felt for near its origin; above this the lesser omentum is pressed against the body of the vertebra. It is well to inject 10 c.c. of novocain into the lesser omentum to anæsthetize it. The finger now separates the aorta from the vena cava. The injection is made with a needle 15 to 20 cm. long, and of course great care must be taken to avoid entering veins; if on aspirating back blood appears in the syringe, the method must be abandoned and a general anæsthetic given. Anæsthesia is complete in 90 per cent of upper abdomen cases, but it is not suitable for splenectomy or for intestinal obstruction. For stomach and gall-bladder surgery the method is excellent.

**Fat and Thin Patients.**—We have heard a surgeon amongst his colleagues say that there are only two real enemies of surgery—"Fat and Physicians." [We are not to be understood to subscribe to the doctrine!—A. R. S.] An article by E. Siefert,<sup>4</sup> of Würzburg, emphasizes the former danger, as the following tables show:—

<i>Died after Operation for—</i>				THE FAT Per cent	THE THIN Per cent
Appendicitis	..	..	..	10	2
Cholecystitis	..	..	..	23	6
Gastric ulcer	..	..	..	17	8
Cancer of stomach	..	..	..	23	16
<i>Complications after Abdominal Operations—</i>					
Suppuration of the incision	..	..	..	35	10
Bronchitis	..	..	..	32	3
Thrombosis or infarct	..	..	..	6	2
Pneumonia	..	..	..	6	4
Collapse	..	..	..	4	1

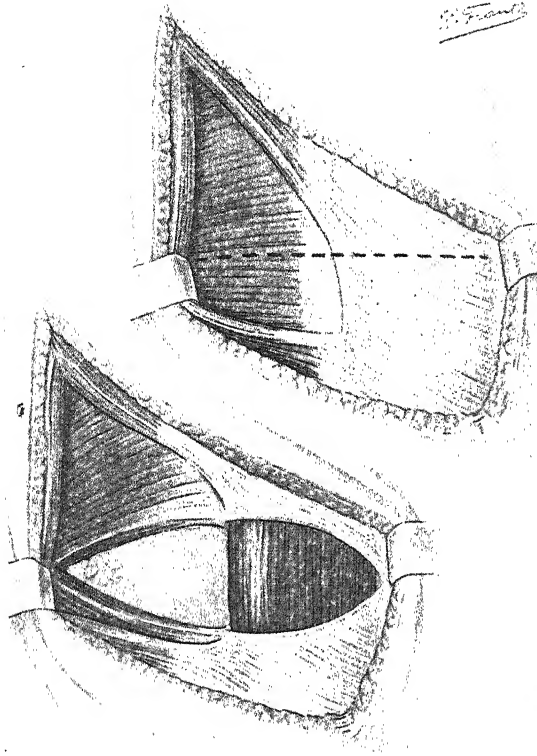
Truly a lamentable indictment of "this too, too solid flesh"! The surgeon will not agree with Julius Cæsar's desire, "Let me have men about me that are fat, sleek-headed men, and such as sleep o' nights."

**Omental Grafts.**—H. F. Graham,<sup>5</sup> of Brooklyn, speaks in favour of free omental grafts to stop oozing from deperitonealized surfaces and to prevent adhesions. He maintains, and so do others, that they do not die, but, become

## PLATE I

### LATERAL ABDOMINAL INCISION

(H. COSTANTINI AND R. MARILL)



*Above:* Third step. Horizontal separation of the internal oblique and transversalis muscles prolonged by section, also transverse, of the anterior sheath of the rectus muscle. This incision is made typically at an equal distance from the pubis and umbilicus, but if necessary may be made higher or lower according to the lesions. *Below:* Fourth step. Exposure of the peritoneum, which is about to be incised.

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vascularized and later absorbed, leaving their endothelium intact. The thinnest and most vascular piece of omentum available should be used, and the detached piece should be larger than the area to be covered, its edges being folded under, and fixed on with fine catgut sutures. The grafts will resist infection. [The evidence for Graham's opinion is not very conclusive.—A. R. S.]

**Amniotic Fluid in Abdominal Surgery.**—H. L. Johnson<sup>6</sup> believes, on the strength of animal experimentation, that amniotic fluid introduced before operation into the peritoneal cavity produces a defence mechanism which protects against infection at or after operation, especially colon-anastomosis. It may be obtained in a sterile and concentrated form from slaughtered cows, about one in five of which are pregnant. From 100 to 200 c.c. may be introduced.

**Duodenal Fistula.**—This uncommon condition usually follows operations on the duodenum, or less often the gall-bladder or kidney. V. Hurley,<sup>7</sup> of Melbourne, reporting two cases, points out that if the discharge is continuously aspirated by a suction apparatus, the wound carefully protected with zinc-oxide and castor oil, and plenty of fluids and chlorides are given to maintain body weight, the fistula will often close. If it does not, jejunostomy is indicated; local attack on the duodenum will probably fail, and gastrojejunostomy still allows stomach contents to reach the fistula. (*See also* KIDNEY, SURGERY OR.)

REFERENCES.—<sup>1</sup>*Rev de Chir* 1934, lin, 497, <sup>2</sup>*Ann of Surg* 1934, Nov, 968, <sup>3</sup>*Amer Jour. Surg* 1934, Sept, 481, <sup>4</sup>*Munch med. Woch* 1934, Dec, 1917; <sup>5</sup>*Ann. of Surg* 1934, Nov., 960, <sup>6</sup>*New Eng Jour. Med* 1935, March, 557, <sup>7</sup>*Austral and N. Z Jour Surg*. 1935, Jan, 261

### ACNE ROSACEA. (*See* ROSACEA.)

### ACNE VULGARIS.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

H. Goodman<sup>1</sup> has treated several hundred patients with acne vulgaris and other pustular conditions of the skin with *physiological sodium chloride solution* both intravenously and locally into the pustules. The first intravenous injection was 100 c.c., which was increased by 50 c.c. until a maximum of 250 c.c. was reached. If the patient had only one or two pockets of pus, the solution was injected locally, directly into the mass of pus. Injections were made round the inflammatory base as well. The amount varied with the quantity that could be injected. The pustular elements had always receded under this type of treatment. The large pus pockets of the condition sometimes called 'cystic acne' cleared up and remained clear. Furuncles were also amenable to this form of therapy, and it seemed to make no difference whether the furuncle was in the frank pustular stage or in the stage before ripening.

REFERENCE.—<sup>1</sup>*Arch. of Dermatol. and Syph.* 1935, xxxi, June, 828.

### ADDISON'S DISEASE. (*See* ADRENAL GLANDS.)

### ADRENAL GLANDS.

Sir Walter Langdon-Brown, M.D., F.R.C.P.

**The Cortical Hormone.**—J. M. Rogoff,<sup>1</sup> who, in conjunction with G. N. Stewart, made the original observations on the cortical hormone, is of opinion that its extraction in a purified crystalline form has not yet been achieved.

**Chronic Adrenal Insufficiency.**—M. Packard and H. E. Wicksler<sup>2</sup> give this name to a clinical syndrome of which they had previously reported one instance and now describe four more. The outstanding clinical features are extreme emaciation with complete loss of body fat, asthenia, anorexia, polyneuritis, trophic ulcers, and a high level of non-protein nitrogen in the blood. Pigmentation and hypotension are, however, absent, the condition therein

differing from Addison's disease. A degenerative lesion of the adrenals was found at necropsy. They claim encouraging results from *cortical extract* and a diet rich in *vitamin B*. It should be noted, however, that in one of their cases a bronchial carcinoma was found with metastases in both adrenals.

**Treatment of Addison's Disease.**—Maranon and others,<sup>3</sup> reporting on the treatment of 12 cases of Addison's disease by *common salt*, come to the conclusion that in most cases it gives good and occasionally surprising results. In their experience no other treatment, even by cortical hormone in large doses, is as effective, though they would still use this if intercurrent infections, attacks of ketosis, or other complications, supervened. The symptoms which have been most favourably affected are loss of weight and appetite, digestive troubles, and pigmentation. They find that in doses of from 2 to 10 gm. of sodium chloride (usually 4 to 6 gm.) the treatment is well borne. To avoid gastric disturbances the salt can be given with milk or with bicarbonate of sodium. This method appears to remedy the disturbed sodium and potassium balance, the intense dehydration, and the liability to ketosis.

Loeb and others<sup>4</sup> also have come to the conclusion that if adrenal insufficiency is not relieved by salt, it will not be relieved by commercial adrenal extracts given in the usual dosage.

C. Stanton Hicks and M. L. Mitchell,<sup>5</sup> on the other hand, advocate treatment by 3 gm. daily of minced and dried fresh *adrenal tissue*, deprived of its fat.

**Adrenalin-like Crises due to a Paraganglioma.**—This is perhaps the most suitable place in which to record an interesting case described by J. Bauer and R. Leriche.<sup>6</sup> A man of 40 had for a year previously had attacks of hypertension, in which the diastolic pressure was not affected, accompanied by pallor, sweating, tremors, epigastric discomfort, and precordial pain. The attacks always came on at about the same hour, and, at first infrequent, soon occurred daily. In the attacks both the red and white cell-counts increased and there was marked hyperglycemia. They recalled the symptoms produced by an overdose of adrenalin, but no pressor substance could be detected in the blood, nor did pycnography reveal an adrenal tumour. Exploration showed normal adrenals, but a paraganglioma the size of a cherry close to the aorta. The tumour was removed. Five months later the patient reported that he had had no attacks since the operation, but that he had a sense of fatigue even greater than before, when the crises were occurring.

REFERENCES.—<sup>1</sup>*Jour. Amer. Med. Assoc.* 1934, ciii, Dec. 8, 1764; <sup>2</sup>*Arch. of Internal Med.* 1934, liv, July, 18; <sup>3</sup>*Presse méd.* 1935, xliii, March 30, 505; <sup>4</sup>*Jour. Amer. Med. Assoc.* 1935, June 15, 2150; <sup>5</sup>*Proc. Roy. Soc. Med.* 1935, xxviii, May, 932; <sup>6</sup>*Presse méd.* 1934, xlii, Sept. 5, 1385.

## ADRENAL GLANDS, SURGERY OF. (See also SYMPATHETIC NERVOUS SYSTEM, SURGERY OF.)

Hamilton Bailey, F.R.C.S.

### Tumours of the Adrenal Glands.—

**TUMOURS OF THE CORTEX.**—These are more common in females. Often the adrenal syndrome of Kraus is seen. This consists of precocity, virilism, and hirsutism. The trend is towards masculine characteristics.

**TUMOURS OF THE MEDULLA.**—These are of four varieties:—

1. *Neuroblastomata* occur nearly always in children under one year of age; they are very malignant.

2. *Neurocytomata* are often divided clinically into three sub-groups: (a) Pepper's tumour occurs usually on the right side and is characterized by metastases in the liver and kidneys; (b) Hutchinson's tumour occurs more frequently on the left side, and metastasizes chiefly to bones, especially those of the orbit and skull; (c) A group which is associated with early and profound anaemia.

3. *Gangliomata* vary in malignancy and occur usually in females and youths.

4. *Paragangliomata* are derived from the chromaffin cells. They are rare, and, in contra-distinction to the other medullary tumours, occur only in adults. These neoplasms are essentially benign and are associated with permanent or paroxysmal hypertension.

Several tumours of the last type which had been removed successfully were shown at the Forty-sixth Annual Meeting of the American Association of Genito-Urinary Surgeons (H. Culver and M. Davison<sup>1</sup>). The diagnosis of tumours of the adrenal is extremely difficult. Most of them are discovered at necropsy. Pyelography is sometimes helpful. According to F. Hinman,<sup>2</sup> the kidney is nearly always displaced laterally and its pelvis is rotated.

**METASTATIC GROWTHS IN THE ADRENALS.**—The adrenal medulla is a common site for a metastatic tumour invasion. Among 371 cases of malignant tumours coming to necropsy there were secondaries in the adrenal glands of 49. These included cases where the primary growth was situated in the breast, œsophagus, stomach, testicle, and penis. Melanomata appear to have a special tendency to metastasize in the adrenals. (E. M. Burke.<sup>3</sup>)

**SUB-TOTAL ADRENALECTOMY IN HYPERADRENALISM.**—J. L. De Courcy and his associates<sup>4</sup> have performed subtotal adrenalectomy for hyperadrenalism in six cases. Over-activity of the suprarenals is, they say, analogous in every way to over-activity of a thyroid. Partial adrenalectomy in hypertension gives results comparable to thyroidectomy.

**Addison's Disease.**—S. L. Simpson<sup>5</sup> believes that 75 per cent of cases of Addison's disease are due to tuberculosis, 20 per cent to atrophy, and 5 per cent to other causes, such as syphilis and neoplasm.

A. E. Payne<sup>6</sup> reports three cases of Addison's disease in which the X-ray examination suggested calcification of the suprarenals. He states that demonstrable calcification of the suprarenals occurs in many cases of Addison's disease and in some instances an X-ray examination may be the deciding factor in the diagnosis.

H. Bailey<sup>7</sup> describes a case of a woman with advanced Addison's disease treated by adrenal grafting. The grafts were obtained from an infant who died three hours after birth, and they were placed on the deep surface of the rectus sheath on either side. Before operation the blood-pressure was 80 or under. Four months later the blood-pressure was 124, the pigmentation was not so deep, and the patient had so far improved that she was able to attend to her household duties. It is impossible to say how long the grafts will function.

REFERENCES.—<sup>1</sup>*Trans. Amer. Assoc. Gen.-Urin. Surgeons*, 1934, xxvii, 139; <sup>2</sup>*Ibid.* 155; <sup>3</sup>*Amer. Jour. Cancer*, 1934, xx, 338; <sup>4</sup>*Jour. Amer. Med. Assoc.* cii, 1118; <sup>5</sup>*Proc. Roy. Soc. Med.* 1934, xxvii, 383; <sup>6</sup>*Brit. Jour. Radiol.* 1933, vi, 747; <sup>7</sup>*Practitioner*, 1935, cxxxv, 528.

A. Rendle Short, M.D., F.R.C.S.

**Adrenalectomy.**—A French Surgical Congress<sup>1</sup> in October, 1934, considered the subject of adrenalectomy. The operation, according to M. Stricker, of Mulhouse, has been performed for the following conditions:—

1. *Epilepsy*.—Valueless.

2. *Arterial Hypertension*.—This may be permanent or paroxysmal, associated with a tumour called *paraganglioma of the medulla*. Seven cases, more or less successful, are reported in the former group. Excellent results are obtained in the second group. The patients have acute attacks of hypertension, which sooner or later prove fatal if not operated on. The growth is sometimes (2 out of 7 cases in the experience of Mayo and Leriche) outside the suprarenal, in other cases no growth is found. "Adrenalectomies carried out for paragangliomas count amongst the finest results of endocrine surgery."

3. *Obliterative Arteritis*.—Oppel, of Leningrad, has been practising adrenal-ectomy for this condition for many years, and he and his fellow-workers speak of 200 cases. The theory is that there is an underlying spasm of the arteries and of their vasa vasorum which can be relieved by cutting off the source of adrenalin. Unchecked, the condition goes on to degeneration of all coats of the artery and obliterative thrombosis (Buerger's disease). Leriche in France has operated on many of these cases. The results are variable, occasionally very successful, but often there is no marked improvement. [I have seen one of Leriche's cases in which the benefit was striking.—A. R. S.]

4. *Raynaud's Disease*.—Too few to judge.

5. *Ill-defined Vascular Troubles*.—Leriche has had some successes in a few cases with permanent cyanosis and trophic ulceration.

4. *Suprarenal Tumours*.—Paraganglioma of the medulla has already been referred to. Tumours of the cortex are more frequent, and may give rise to endocrine disturbances of three varieties: (a) Hypertension; (b) Adrenal insufficiency; (c) Genito-suprarenal syndrome. The patient shows signs of pseudo-hermaphroditism or of virilism, associated with cortical tumour, congenital and often bilateral. A few cases (about eight) of successful removal and amelioration are reported. The growths are often malignant. (d) Some suprarenal tumours produce no endocrine symptoms.

7. *Suprarenal Hæmorrhages*.—These may be found at operation, and may be bilateral. Probably most perinephric hæmatomata are suprarenal in origin. Large hæmorrhagic cysts may follow if the patient survives. Crile's operation of denervation of the suprarenal was also referred to (see MEDICAL ANNUAL, 1935, p. 15).

In the discussion which followed, Leibovici quoted Silbert, of New York, to the effect that of 247 cases followed for five years, with no special treatment, 192 had to be amputated. He analyses the published results of adrenalectomy, and finds that it does not appear to lead to a permanent lowering of blood-pressure, nor to reduce the number of amputations. Probably lumbar ganglionectomy is a better operation. Silbert himself took part in the debate, and claimed that the medical treatment of Buerger's disease is not so unsatisfactory as is often supposed; in 98 per cent of the cases it was successful. Only 19 out of 500 came to amputation. [There is some discrepancy here, which the report does not clarify.—A. R. S.]

The experience of a Leningrad Clinic is published by D. Arkanikow.<sup>2</sup> In five years 140 cases of arteritis obliterans have been treated by adrenalectomy. The results are set out in the following table.

TIME OF OBSERVATION	GOOD	SUFFICIENT	POOR	UNKNOWN	DEATHS	TOTAL
Five to six years ..	10	14	2	16	2	44
Four to five years ..	8	11	2	14	3	38
Three to four years ..	5	6	2	4	1	18
Two to three years ..	11	8	4	4	2	29
One to two years..	3	6	0	2	0	11
Total ..	37	45	10	40	8	140

A 'good' result means the disappearance of pain, the healing of ulcers, and avoidance of amputation. Some outstanding successes are related in detail. A 'sufficient' result means that the pains have improved, or pain has disappeared, but ulcers did not heal, or the patient had already lost a limb, or



amputation was necessary but the patient became able to work. Most of the patients had been ill for more than a year, and 80 per cent of them were under forty years of age.

REFERENCES.—<sup>1</sup>*Presse méd.* 1934, Oct., 1647; <sup>2</sup>*Lyon chir.* 1934, Sept.-Oct., 521.

### AGRANULOCYTOSIS. (See BLOOD DISEASES.)

## ALCOHOL AND DRUG ADDICTION. *H. Devine, M.D., F.R.C.P.*

### ALCOHOLISM.

**Methylated Spirit Drinking.**—P. E. Turner,<sup>1</sup> who is the chief Medical Officer of the Salvation Army, writes on this subject. The writer has made some inquiries in regard to the incidence of this habit in America, but he deals more fully with this problem as it is met with in this country. The Home Office statistics of drunkenness from methylated spirit in England and Wales are set forth in *Table I*:—

*Table I.*—CONVICTIONS FOR DRUNKENNESS ATTRIBUTED TO METHYLATED SPIRIT DRINKING.

YEAR	ENGLAND AND WALES	COUNTY OF LONDON
1928	446	40
1929	409	39
1930	476	22
1931	582	24
1932	596*	30

\* 2 per cent of the convictions for drunkenness.

Mr. Skelton, Under-Secretary of State for Scotland, furnished the figures given in *Table II*:—

*Table II.*—CONVICTIONS ATTRIBUTED TO METHYLATED SPIRIT DRINKING, INCLUDING SURGICAL SPIRIT, IN SIX SCOTCH BOROUGHES,\* ENGLAND, AND WALES.

YEAR	ENGLAND, WALES, AND SCOTLAND	YEAR	ENGLAND, WALES, AND SCOTLAND
1924	1497	1929	1017
1925	985	1930	963
1926	1088	1931	1031
1927	969	1932	1106
1928	969	1933	1002

\* The six boroughs are Glasgow, Edinburgh, Dundee, Perth, Inverness, Stirling, and the figures include a considerable proportion of repeated convictions of the same person.

These last figures are in themselves sufficiently disturbing, but a letter to hand on behalf of Miss Horsbrugh, who has taken a deep interest in this subject, in calling attention to the press reports of the death of a tramp in Inverness-shire lately, in which a man was convicted for manslaughter (it was stated that both the tramps had been drinking methylated spirit, and the bottle was found with them), comments as follows: "One of the difficulties about stating the

number of convictions is that the police are not allowed to state that a man or woman is found drunk due to methylated spirit drinking unless a methylated spirit bottle is found on the person, and in many cases where a conviction has been made it has been scheduled as a conviction of some other sort, although the man or woman has been under the influence of methylated spirit."

Since the supply of the figures above quoted the subject has been brought up again several times in the House of Commons, as in April last, when Mr. Hore-Belisha announced "the use of new formulæ as from March 15 for surgical spirit, to achieve a still higher degree of unpalatability in the product", and Mr. Skelton later in the month expressed the hope that the new formulæ "will render surgical spirit undrinkable".

By the courtesy of the Customs and Excise authorities Turner has been favoured with a copy of Notice No. 10 giving the new approved formulæ, which are as follows:—

				Per cent
1. Castor oil	..	..	..	2½
Methyl salicylate	..	..	..	½
Diethyl phthalate	..	..	..	2
Industrial methylated spirit to	..	..	..	100
2. Castor oil	..	..	..	2½
Mineral naphtha..	..	..	..	½
Diethyl phthalate	..	..	..	2
Industrial methylated spirit to	..	..	..	100

Quite recently Turner has been able to obtain more detailed information as to the extent of methylated spirit drinking in Scotland.

The figures in *Table III* show the number of persons proceeded against for drunkenness during the past five years, whose condition is believed to have been due to the drinking of methylated spirit:—

*Table III.*—PERSONS IN SCOTLAND PROCEEDED AGAINST FOR DRUNKENNESS ATTRIBUTED TO METHYLATED SPIRIT DRINKING.

YEAR	MALES	FEMALES	TOTAL
1929	313	102	415
1930	500	163	663
1931	277	77	354
1932	465	120	585
1933	462	91	553

With regard to the number of persons apprehended more than once during 1933 it is interesting to note that although there were 553 apprehensions for this offence 80 persons were responsible for 216 of these, leaving 337 persons who were before the court for the first time.

The question of the sale and consumption of methylated spirit has been and is causing some consternation in Scotland, to the extent that representative magistrates from Aberdeen, Dundee, Edinburgh, and Glasgow are shortly to meet in Glasgow to discuss the whole matter, with a view, it is hoped, to finding some practical means of gaining control over the indiscriminate selling and purchasing of methylated and surgical spirits.

During the month of December Turner was asked for his observations on the question of the control of the sale and supply of methylated and surgical spirits, and he furnishes some extracts from his report as follows:—

"In the first place, it is quite apparent that the revenue control of the supply

and sale by retailers of methylated spirit is wholly inadequate, and requires very considerable strengthening. Any person may take out a licence issued by the Excise authorities for the small sum of 10/- annually, without question. If the charge for an Excise licence were raised from 10/- to, say, £4 or £5, no loss would be sustained by the revenue; in fact, an increase might result, and the sale of methylated spirit would be confined to a respectable class of trader, who would be willing to comply with any restrictions imposed."

Provided it is decided to continue the issue of Excise licences to drysalter and others, he offers the following suggestions which might prove effective, and, if made punitive, cause a gradual diminution of the number of addicts: "(a) That every bottle or receptacle for holding the spirit should bear the name and address of the seller of the spirit; this would greatly assist the police in tracing the person from whom the spirit has been obtained by persons found drinking such spirit or drunk from the effects. (b) That all dealers keep a stock book showing accounts of receipts and sales, including the name and address of the purchaser, and the purpose for which the spirit is required. (c) That it should be an offence to obtain methylated spirit from a retailer by means of false pretences. (d) That it should be an offence to give a false name and address when purchasing the spirit. (e) That it should be an offence to hawk such spirit in the streets. (f) That it should be an offence to use methylated spirit or surgical spirit in any form as a beverage."

In concluding his paper, Turner observes that in the histories of those given to this lamentable form of indulgence there seems to stand out clearly the fact that methylated spirit drinking is the lowest part of a downward slope in inebriety.

#### DRUG ADDICTION.

**Use of Barbiturates for Suicide.**—The Paris correspondent of *The Lancet* writes on the use of barbiturates for suicide.<sup>2</sup> It would appear that the vogue of barbituric suicides has now become so embarrassing that the Minister of Public Health has asked the Academy of Medicine to give an opinion on the desirability of including certain barbiturates and other drugs among those which cannot be bought without the signature of a doctor. The Société de Pharmacie de Paris recently adopted a unanimous resolution recommending, among other things, the examination of this problem by a commission, which might well be the Commission Permanent du Codex. Hitherto legislation and practice have wobbled uncomfortably from one extreme to another. There have been times when one could not buy syrup of tolu, whereas at present one can buy without prescription all one needs and more to ensure an early demise. As for the barbiturates, whose usefulness in insomnia is unquestionable, the suggestion has been made that they be combined with ipecacuanha in proper proportions, assuring the speedy return of the drug taken in suicidal doses; indeed, a formula for the purpose is said to have been devised already. It is hoped that this expulsive compromise will be adopted, for the public is so accustomed to the purchase of certain popular hypnotics it would surely resent the imposition of medical restrictions at this time of day. After all, poisoning by the barbiturates is fairly dealt with in hospital provided that the case is not exceptionally severe. From the Saint-Lewis Hospital, Dr. C. Flandin reports encouraging experiences, in more than 200 cases, with injections of *strychnine*. He prefers it to coramine or anything else as an antidote; but the doses must not be timid. He has never known *strychnine* kill the patient offhand, even when 50 mgrm. was given intravenously. The dosage he recommends, under the control of Chovstek's sign, is between 20 and 50 mgrm., repeated every half-hour or hour till the desired effect has been obtained. He

reinforces this treatment by venesection, blood transfusion, and, above all, artificial respiration supplemented by the inhalation of a mixture of oxygen and CO<sub>2</sub>. Adrenalized serum, given per rectum, is also useful. If too much strychnine has been given, there are antidotes to it; gardenal is too toxic for this purpose, but isonal gives a wider margin of safety. Flandin dispenses with alcohol, for he is inclined to regard it as an adjuvant, rather than as an antidote, to barbiturate poisoning.

Sir William Wilcox<sup>3</sup> also draws attention to the dangers of the use of the barbituric acid group of drugs. He states that there can be no doubt that a very large group of barbituric acid derivatives occupy the foremost place amongst the drugs of addiction. The actual danger to the public in this country at the present time from addiction to these drugs is greater than that from any other group of drugs, even including the dangerous drugs, which are controlled by special Acts and Regulations. The barbituric acid group of drugs have a special action on the higher brain centres of a narcotic nature, and it is this action which gives them their high place amongst the hypnotic drugs. The continued daily dose of these drugs in therapeutic doses may cause impairment of speech, ataxic gait, paralysis of the eye muscles, and other motor nerve affections in various distributions. Also mental disturbances, such as hallucinations of vision, may result. The changes due to altered metabolism from the barbituric group of drugs are less pronounced than with the dangerous drugs, but they occur in an amount which is well worthy of consideration. The need for care in the use of these drugs cannot be too strongly emphasized. The risk of suicide from accidental or purposeful overdosage is a very real one. The author has seen a large number of cases of suicide, or attempts at suicide, in people who have taken these drugs over long periods. They take an overdose, sometimes with the desire to kill themselves, but generally because their minds are so confused that they take the overdose not caring what may happen, and hoping for the worst. It is essential that the public should not have access to these drugs except by medical prescription, and this prescription should be retained by the pharmacist, and should not be repeated except under medical order. The members of the medical profession should exercise care in the prescription of these drugs, and should not order on one prescription a quantity which, if all were taken at once, would be a fatal dose.

#### **Some International Aspects of the Problem of Drug Addiction.**

Sir Malcombe Delevingne<sup>4</sup> writes on this subject. He feels that this problem is deserving of attention, not only because of the intrinsic importance of the problem of drug addiction, but also because the international treatment of the problem during the last fourteen years has afforded a striking example of what can be accomplished in a difficult field by international co-operation aided by the machinery of the League of Nations. The author states that the problem of drug addiction is far from being solved, and that perhaps it never can be finally solved. In the West it is largely an outcome of stress and strain of modern life, and the stress and strain increase rather than diminish. He thinks, however, that the work of the last fourteen years has shown that the danger, ever-present though it may be, can be kept in check by united action.

**Drug Addiction in India.**—Lieut.-Colonel R. N. Chopra<sup>5</sup> has for many years made a special study of the problems of drug addiction in India, and in a recent article has given an interesting summary of the existing situation and the methods of treatment of addicts. He begins with the remark: "Although in India drug addiction has existed on a more extensive scale than in any other country in the world, with the exception of China, little is known regarding the problem." He points out that in India both opium eating and opium smoking are prevalent, and that the hemp drugs are used extensively. Besides these,

alcohol, cocaine, chloral hydrate, and even the barbiturates are taken as drugs of addiction. The earliest drug of addiction recorded is the juice of the soma plant, which was the delight of the Aryan settlers; but what this plant was no one now knows. Mohammedians introduced opium, and at the time of the Mogul Empire opium, cannabis, and alcohol were all in use. Moreover, very potent concoctions were employed—for example, the 'four-leaved' drink of Akbar's court contained wine, opium, Indian hemp, and poppy capsules.

The opium habit is not general, but is prevalent only in certain districts, and the total number of Indian addicts is about one and a half millions. The habit is decreasing, since the annual opium consumption has fallen from 1,000,000 lb. to 400,000 lb. during the last twenty years. The administration of opium to infants to keep them quiet whilst the mother is at work is one of the most pernicious aspects of the problem. Hemp addicts are estimated at one or two millions, but here also the annual consumption has been halved since 1912. The figures from one asylum showed that about 20 per cent of the patients had been hemp addicts. Alcohol in the form of native beers has long been drunk in India, but distilled liquors, which are taking the place of opium and hemp in some areas, are evidently on the increase. The cocaine habit has become established around Calcutta, and large quantities (estimated as 200,000 oz. annually) are smuggled from the Far East. The source of this supply is generally suspected, but is not mentioned by the author. Colonel Chopra a few years ago reported a curious new habit in North India—namely, the taking of chloral hydrate as a cheap intoxicant instead of alcohol—and he mentions that barbiturates are now being employed in the same way. He states that the magnitude of the problem of drug addiction in India is best indicated by the fact that, whereas in most of the countries in Europe and America the addiction rate of the population is from 0.1 to 0.2 per cent or less, in many provinces in India the rate is 1 to 3 per cent or more.

The article concludes with an interesting review of the methods of treatment of the various forms of drug addiction. One new and surprising remedy is the production of a blister and the hypodermic injection of the blister fluid. The results obtained by this treatment in opium addiction are stated to be striking. The rationale of the method is still obscure.

**TREATMENT OF DRUG ADDICTION.**—G. Laughton Scott<sup>4</sup> observes that when his particular method finds a place in the text-books its author may believe that later developments should be published, even though the field covered is of restricted general interest. Addiction is rare in England, but abroad the demand for a reliable treatment is ever more insistent. It may be worth while, therefore, to describe a radical improvement and simplification of the 'painless method' associated with his name, whereby the process of medical withdrawal can be carried out successfully by any careful practitioner.

First, as to rationale. Drugs of the atropine group have been employed in countless systems, but always previously in massive doses to produce delirium and confusion, under cover of which the patient is separated from his drug. All such methods constitute a serious shock to the frequently debilitated addict, with the result that convalescence is delayed and the final issue imperilled. A very different use of atropine has great advantages and no such dangers.

*Atropine* shows two distinct and, in some respects, opposite effects, according as it is given in minute or in ordinary doses. With the latter, of course, vagal depression is constant, but such small amounts as 10 to 30 gr. occasion vagal stimulation. Scott has shown that this primary vago-stimulant action of small dosage continues when tolerance to atropine is established. Thus a patient who has received frequent minute doses for a week will show a slowed

pulse when the dose becomes  $\frac{1}{100}$  gr. This fact is used in his simplified process of withdrawal.

The morphinist or other addict is one who has become accustomed to preserve vagal preponderance and sympathetic depression by means of his drug. Less than his normal supply means sympathetic overaction, while deprivation ushers in a series of sympathetic explosions which may even endanger life. On the other hand, frequent minute doses of atropine secure for him the steady vagal tone which means a smooth passage to recovery.

The process is very simple in practice. Atropine  $\frac{1}{100}$  gr. is dissolved in saline with the day's supply of morphine, "half a drachm to be injected every two hours while the patient is awake". Obviously sleep is a measure of the patient's comfort, and the more he sleeps the fewer doses he needs. The amount of drug actually used forms the maximum for the day following, and the process is continued until less than  $\frac{1}{2}$  gr. is taken in the twenty-four hours. Atropine is increased so slowly that ocular symptoms are not produced, and luminal is administered in large and increasing amounts. The method is automatic and self-regulating, and the test of success is slightly slower-than-normal heart-beat, which is quite invariable with proper dosage.

The conception of the addict as sustaining by his drug an artificial vagal preponderance, and needing to have it continually sustained throughout withdrawal, is also useful when convalescence is considered. He will be safe from unpleasant sensation so long as his threshold of fatigue is not exceeded, but if he oversteps the mark sympathicotonia immediately is manifest. His physical and mental powers will rapidly improve, but their exercise must be most carefully watched, especially in the early stages, and indeed, it may be doubted whether a completely normal day's work should be undertaken for several months.

Painless withdrawal, anxious consideration of problems of fatigue, and adequate psychological treatment are the three factors without which constant success is impossible. The neglect of one, and often of all, has made the usual prognosis in addiction unduly gloomy.

Writing on morphinism Van Ostromislensky<sup>7</sup> outlines a new theory of addiction and describes his method of treatment. He holds the view that morphia addicts are persons whose organisms have acquired a need for morphine. Without a definite daily dose of morphine they are doomed to severe suffering. Their craving for morphine is more compelling than all other cravings—hunger, thirst, rest, or sleep. A normal person using morphine for relief of pain can always stop the injections at will without feeling any deprivation. The morphine addict, on the contrary, undergoes, on the withdrawal of morphine, very complex symptoms of intoxication. They cause unbearable sufferings, and sometimes end in speedy death.

It is the aim of the writer to show that withdrawal symptoms are to be regarded as a manifestation of anaphylactic shock, and his methods of treatment are based upon this view. To the direct question, in what ways can the addicts be liberated from their slavery, i.e., from their organic need for morphine, the writer's theory gives the following reply:—

Morphine withdrawal symptoms cannot be considered otherwise than an anaphylactic shock. Consequently, every interference, and, in particular, every anti-shock preparation which checks or relieves the shock in animals, must in theory check or relieve to the same extent the torture of morphine withdrawal.

Clinical observations are claimed to have completely confirmed this prediction of the theory. In practice, the writer had first to study in detail the physiological properties and the complex chemical structure not only of

morphine, but also of all its known relatives—codeine, dionin, peronine, heroin, dioclide, dilandid, eucodal, paramorphine. A long and complex chain of reasoning resulting from this general analysis has allowed him to find fifty-four anti-shock preparations. One of them, *diphenylmethylpyrazolonyl* (rossium), possessing relatively low toxicity, renders innocuous from three to four lethal doses of antigen. This synthetic substance belongs to a class of organic compounds no member of which has ever before been employed in therapy. This preparation was brought by the writer to the attention of the medical profession and studied in various sanatoria and hospitals of the United States and Canada. His preliminary observations have been, as a result, confirmed by a large number of physicians. As the author anticipated, diphenylmethylpyrazolonyl (rossium) proved to be a valuable therapeutic preparation for the unfortunate morphine addict. In a five-day course taken by mouth it checks the most severe symptoms of withdrawal in drug addicts (morphinism, heroinism, codeinism, etc.); it markedly decreases all other symptoms, and stops further craving.

REFERENCES.—<sup>1</sup>*Brit. Jour. Inebriety*, 1935, xxxii, April, 197; <sup>2</sup>*Lancet*, 1935, i, June 29, 1411; <sup>3</sup>*Brit. Jour. Inebriety*, 1934, xxxi, April, 131; <sup>4</sup>*Ibid*, 1935, xxxii, Jan., 126; <sup>5</sup>*Indian Med. Gaz.*, 1935, lxx, March, 121; <sup>6</sup>*Brit. Med. Jour.*, 1934, ii, Dec. 22, 1149; <sup>7</sup>*Med. Record*, 1935, cxl, June 19, 556.

#### AMBLYOPIA, TOBACCO. (See TOBACCO AMBLYOPIA.)

#### AMOEBIASIS.

*Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

In a study of amoebic dysentery among the troops at Quetta D. T. M. Large and O. K. Sankaran<sup>1</sup> discuss the diagnostic characters of the causative *E. histolytica* in fresh stools, and they point out that if only those containing definite red corpuscles in actively progressing amoebae are considered to be pathogenic ones, then 28.8 per cent would be regarded as *E. histolytica*, and only 6.5 per cent of the total dysentery cases would be classed as amoebic in nature. If, however, those containing bodies resembling partially digested red corpuscles are included, then *E. histolytica* comprised 38.5 per cent of all enteric amoebae and the percentage of amoebic dysentery cases rose to 12.1 per cent. Mixed bacillary and amoebic infections amounted to 4.3 per cent. Relapses showing the same type of infection were very few and fresh infection could not be excluded. R. Knowles and B. M. Das Gupta<sup>2</sup> report finding *E. histolytica* in a *Silvus rhesus* monkey, and this was transmitted to a human volunteer, in whom it has persisted for two months.

R. Hegner<sup>3</sup> has also studied monkey carriers of *E. histolytica* after inoculating them rectally with exudate containing active amoebae from a case of human dysentery. In all four animals cysts were passed continuously for several weeks, so they were more than temporary carriers. Yet on killing the animals and making minute macroscopic and microscopic examinations of their large bowel no amoebae could be discovered in the tissues.

H. G. Johnstone and M. K. Iverson<sup>4</sup> deal with food-handlers in the epidemiology of amoebiasis by means of examining 747 employees in San Francisco hotels, clubs, and hospitals, with the result that 22, or 2.94 per cent, were found to be infected with *E. histolytica*. Two instances of the transmission of the disease in families are recorded. J. Andrews<sup>5</sup> reports on the examination of fingers grossly contaminated with material containing *E. histolytica* cysts, and found washing readily removes the infection except occasionally from beneath the finger nails, which might possibly be a source of infection, although they do not regard it as a very likely one.

TREATMENT.—*Carbarsone* in intestinal amoebiasis is reported on by R. N. Chopra and S. Sen,<sup>6</sup> who note that it is expensive, about Rs.5 (7s. 6d.) per

treatment for a course of 0.25 grm. twice daily for ten days, and in persistent cases a fifteen-day course may be required. In 22 cases, with stool examinations daily for at least six days, a probable cure rate of 77.3 per cent was obtained, but one case was quite resistant, with persistence of *E. histolytica* daily in the stools. The drug was not toxic and has a tonic effect, acts well on oral administration, and does not necessitate the patient's lying up.

R. N. Chopra and others<sup>7</sup> report that in Belgian hares a series of eight intravenous injections of small doses of emetine hydrochloride produces a decrease of residual adrenalin and of the iodine content of the thyroid gland.

G. R. Calender<sup>8</sup> has studied the microscopical characters of the bowel exudate in amœbic dysentery, and he found that in the absence of inflammatory signs *emetine* and *arsenical preparations* produce a prompt cure, the former drug being the more efficient.

REFERENCES.—<sup>1</sup>*Jour. R.A.M.C.* 1934, lxiii, Nov., 303; <sup>2</sup>*Ind. Med. Gaz.* 1934, lxix, July, 390; <sup>3</sup>*Amer. Jour. Trop. Med.* 1935, xv, Jan., 41; <sup>4</sup>*Ibid.* May, 197; <sup>5</sup>*Ibid.* 1934, xiv, Sept., 429; <sup>6</sup>*Ind. Med. Gaz.* 1934, lxix, July, 375; <sup>7</sup>*Ind. Jour. Med. Research*, 1935, xxii, July, 373; <sup>8</sup>*Amer. Jour. Trop. Med.* 1935, xv, March, 189.

**AMPUTATIONS.** (See also BLOOD-VESSELS, SURGERY OF; GANGRENE, DIABETIC; GAS GANGRENE.) Sir W. I. de C. Wheeler, F.R.C.S.I.

**Interinnomino-abdominal (Hindquarter) Amputation.**—G. Gordon-Taylor and Philip Wiles<sup>1</sup> write an interesting review of these colossal surgical undertakings in cases of tumour of the upper end of the femur too highly situated for hip-joint amputation. Hogarth Pringle tabulated the literature in the *British Journal of Surgery* in 1916. Gordon-Taylor and Wiles give an account of five cases, of which three were successful—a noteworthy achievement. The extent of the operation is indicated in *Plates II, III*.

**Technique of Operation.**—Spinal anaesthesia was employed in conjunction with general anaesthesia. A modification of Girard's incision was used when conditions permitted. The patient is turned partially over on the sound side with a sand-bag under the shoulder and another under the lower part of the affected thigh. At this stage a blood transfusion is given into one of the veins at the antecubital fossa of one arm. Readers are referred to the original article for details of the various stages in the operation. Briefly the steps are as follows: The external iliac vessels are secured at the level of Poupart's ligament. The latter is divided at each end. Later the dorsum ilii is exposed and sawn through into the sciatic notch. This is better than attempting to disarticulate at the sacro-iliac joint. The symphysis is divided before making the posterior bone section. After division of many important nerves, vessels, and muscles the innominate bone is at last free and is removed together with the lower limb. The important points in the conduct of the operation would appear to be: (1) The most gentle care should be taken in turning the patient: the danger from rough or excessive movement of a patient under spinal anaesthesia cannot be exaggerated. (2) The most thorough organization of blood transfusion arrangements. (3) Division of the posterior portion of the dorsum ilii with the saw is more expeditious and simple than disarticulation of the bone at the sacro-iliac synchondrosis; it is easy subsequently to ablate the auricular portion of the ilium. (4) Hogarth Pringle's incision is that most universally satisfactory. (5) It is almost unnecessary to stress the importance of minimizing hæmorrhage and shock by preliminary control of vessels before division, and of nerve-blocking before section of the trunks.

REFERENCE.—<sup>1</sup>*Brit. Jour. Surg.* 1935, xxii, April, 671.

**ANÆMIA.** (See also BLOOD DISEASES.)



PLATE II

INTERINNOMINO-ABDOMINAL OPERATION

(G. GORDON-TAYLOR AND P. WILES)

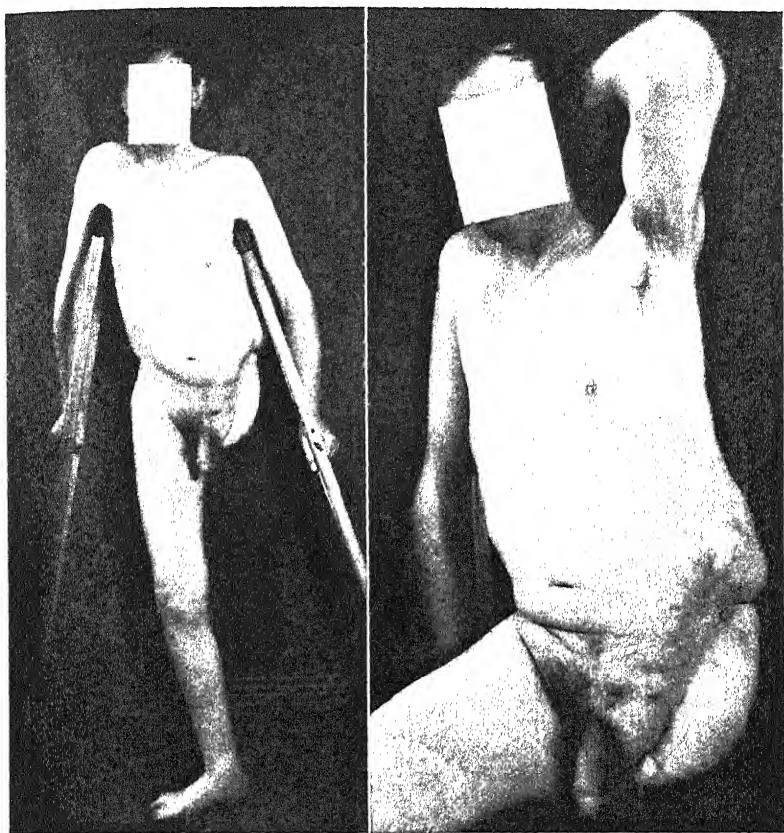
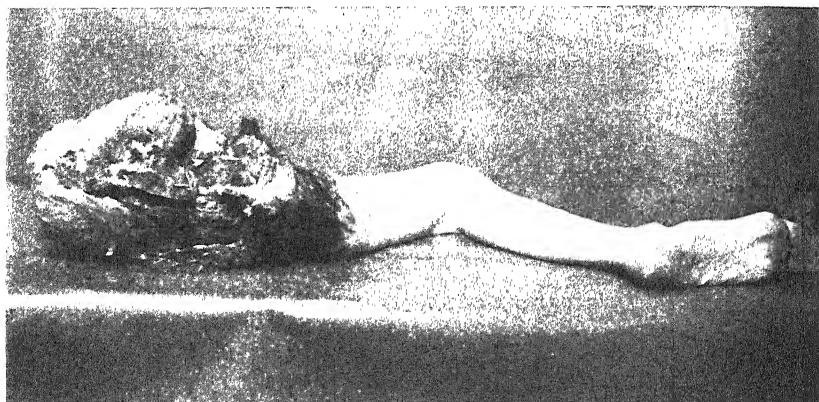


Fig. 4.—Photograph of patient nearly a year after operation.

# PLATE III

## INTERINNOMINO-ABDOMINAL OPERATION—*continued*

(G. GORDON-TAYLOR AND P. WILES)



*Fig. B.*—Photograph of specimen immediately after removal by hindquarter amputation.

*Plates II and III by kind permission of the 'British Journal of Surgery'*

**ANÆMIA, PERNICIOUS.***Stanley Davidson, M.D., F.R.C.P.E.*

**ETIOLOGY.**—It is generally agreed that the fundamental cause of Addisonian pernicious anæmia is a failure of the stomach to secrete a special enzyme. The interaction of this enzyme with some as yet not clearly defined substance of food, produces the specific anti-anæmic factor which is stored in the liver and after liberation to the bone-marrow allows the continuation of normal blood formation. A step further in the elucidation of the problem of the site of manufacture of the enzyme in the stomach has been carried out by E. Meulengracht.<sup>1</sup> As a result of careful histological examination he was able to separate the pig's stomach into three portions—namely, the cardiac gland region, the fundus gland region, and the pyloric gland region, the latter continuing as the glands of Brunner into the duodenum. Dried and defatted preparations of these areas were fed to patients with pernicious anæmia, and the following conclusions were reached from the experiment:—

Castle's intrinsic factor is produced in its greatest concentration in the pyloric portion of the stomach and the duodenum. A feeble activity was present in the cardiac portion, in keeping with the smaller number of glands present to the unit area. The fundus gland portion was inactive. Apart from the physiological interest which has resulted from establishing the localization of the anti-anæmic enzyme, practical results may be hoped for from this investigation. Firstly, by using the pyloric region of the pig's stomach alone, markedly increased concentration of anti-anæmic stomach preparations should be available; and secondly, the discovery of the importance of the duodenal region explains why gastrectomy in human beings so rarely produces a megalocytic anæmia. Thus S. J. Hartfall<sup>2</sup> studied 40 cases of anæmia following gastric operation. The great majority were of the iron-deficiency type. It is not surprising to learn that anæmia was most frequently found in women between the ages of 40 and 50, a period of life which has been shown by all workers to be frequently associated with hypochromic anæmia (*see BLOOD DISEASES—IRON-DEFICIENCY ANÆMIA*). The author states that the production of anæmia, and its degree, are independent of the amount of stomach removed at operation. The essential cause is imperfect absorption and digestion, due to rapid gastric evacuation and intestinal hurry. Certain cases were found to be very resistant to treatment with iron, but the addition of calcium and vitamins B and D, along with a diet to reduce gastric dysfunction, enabled the most difficult cases to be cured.

The view that the loss of intrinsic factor in the gastric secretion in pernicious anæmia is slow and progressive has been advanced by the reviewer previously, to account for the effects which are produced in some cases of pernicious anæmia by the administration of autolysed yeast products which are rich sources of extrinsic factor. Support of this view is now produced by R. Isaacs and S. M. Goldhamer,<sup>3</sup> who draw attention to the diminished amount of gastric secretion in pernicious anæmia. They found that the average rate of secretion was 20 c.c. per hour, as compared to 150 c.c. in a normal person. The authors collected 1500 c.c. from five patients with pernicious anæmia and administered 150 c.c. after incubation with 200 grm. of meat to another sufferer from this disease: a definite rise in reticulocytes and red cells occurred.

The fact that the administration of liver from animals, and extracts made therefrom, produces a dramatic curative effect in pernicious anæmia, clearly indicates that the liver stores the anti-anæmic factor. That the same is true in human beings is shown by S. M. Goldhamer, R. Isaacs, and C. C. Sturgis<sup>4</sup> in America, and J. F. Wilkinson and L. Klein<sup>5</sup> in this country. Extracts of human livers from persons who have died at various ages from various diseases were given to cases of pernicious anæmia. The active principle

was found to be present in the liver in normal persons, and in the foetus at least two months before birth. It was absent in patients in the stage of relapse, who had been untreated or inadequately treated, but was present in adequately treated cases. It may be absent in cirrhosis of the liver and it was found to be in excess in a case of polycythæmia vera. These experiments may explain how a pernicious-anæmia-like blood picture may be present in a patient with disease of the liver. The liver apparently under these conditions may not be able to store, or present to the body tissues, the active principle in the proper form for utilization. D. O. Wright<sup>6</sup> found that about one-quarter of 41 cases of cirrhosis of the liver had a macrocytic blood picture; he was unable to show that the macrocytosis occurred at any particular period in the downward course of the liver cirrhosis, or depended on the degree of obstruction of the portal circulation.

In last year's MEDICAL ANNUAL (p. 20) the reviewer surveyed the evidence which clearly indicated that the extrinsic factor in food was not vitamin B. H. C. A. Lassen and H. K. Lassen<sup>7</sup> have treated eight patients with pernicious anæmia with various yeast preparations, given with and without normal gastric juice. The vitamin B<sub>1</sub> and B<sub>2</sub> contents of these preparations were first assayed biologically. They found that yeast appeared to be without any definite anti-anæmic effect; not even the addition of normal gastric juice could produce, with any degree of certainty, an increase in the content of the anti-anæmic principle.

TREATMENT.—It is generally agreed that the cheapest and best method of treatment available to-day is the intramuscular injection of *liver extract*. Three or four injections of 5 c.c. of many well-known brands of liver extract will bring the patient's blood back to a normal level. It can be maintained there by an injection at an interval which varies from one to six weeks, depending on the potency of the preparation and the individual needs of the patient. Two or three years ago considerable concern was evinced by the reports appearing in the literature regarding inactive preparations being on sale. This problem has been satisfactorily settled by the leading commercial firms. Nevertheless the practising physician must have considerable doubt regarding the quantity of material which should be injected. The manufacturers usually state that each cubic centimetre of a preparation contains the active principle from so many grammes of liver, or in some cases has the therapeutic effect of so many grammes of liver. Since no satisfactory biological test is available other than clinical trial on persons suffering from pernicious anæmia, it is impossible for all commercial firms to have each batch of the product tested. During the past eight years the reviewer has been continuously assaying different makes of liver extract, and has come to the conclusion that the information supplied by the manufacturers may be misleading to the general practitioner. Thus, some brands of liver extract which are claimed to have in each cubic centimetre the active principle from 100 grm., or, in one case, thousands of grammes of liver, were found to be no more potent than the standard makes in which the active principle from 10 grm. is contained in 1 c.c. W. Dameshek and W. B. Castle<sup>8</sup> have attempted a comparative assay of different commercial products, and find that there may be a marked loss in potency during the process of concentration and refining. They conclude by saying that until a specification is clearly defined in terms of what is just a maximal dose, it will be impossible for the practising physician to obtain an accurate impression regarding the relative potency of liver extract.

MORTALITY FROM PERNICIOUS ANÆMIA.—In a review of the registered death-rates from pernicious anæmia, A. Bradford Hill<sup>9</sup> shows that there was

a sudden decline in the death-rate in England and Wales which became apparent in 1928 and was definitely connected with the advent of liver therapy. Since then the death-rate of both sexes had tended to rise slowly and progressively. Comparison of the death-rate and ages shows that the increased mortality since 1928 is largely a product of an upward movement in ages over 55. Even in the younger ages, however, under 55, there is a slight upward movement; so that the original improvement following liver therapy does not appear to be maintained by this statistical survey. In the correspondence which followed Hill's report, certain possible fallacies were suggested as factors in explaining this untoward finding. Nevertheless it was generally admitted that at least part of the explanation lay in the fact that inadequate and imperfect treatment was being given to cases of pernicious anæmia. In the blood clinics of Manchester and Aberdeen, where routine blood examinations are part of the regular follow-up in every case, the mortality figures are excellent. J. Mills and R. Herring<sup>10</sup> have examined the results of treatment in the Royal Berkshire Hospital. Prior to the establishment of a proper blood clinic, the condition of all patients examined, who were receiving uncontrolled treatment, was found to be unsatisfactory. Of 47 cases observed prior to 1934, 9 are dead and 6 have subacute combined degeneration. Only 9 have been well throughout the year. It is essential, if one of the greatest victories medicine ever achieved is to be consolidated, that blood clinics should be made available in every area, so that every case of pernicious anæmia can have his treatment controlled by regular blood examinations. Only by such means can the continuous increase of cases of subacute combined degeneration of the cord be avoided.

#### SUBACUTE COMBINED DEGENERATION OF THE CORD.

**TREATMENT.**—Intense anti-anæmic treatment, particularly by parenteral injection over prolonged periods, is undoubtedly the best method of combating this complication. It is not certain whether anti-anæmic therapy has a specific curative effect on the degeneration of the cord, but it certainly contributes indirectly to the improvement of the neurologic manifestations. In more than 70 per cent of patients there is a symptomatic improvement, but there may be little or no improvement in the signs. The manifestations resulting from degeneration of the posterior columns respond infinitely better than those due to lesions of the lateral columns. Thus the reviewer has frequently had individuals so ataxic as to be unable to walk, who, after intensive liver treatment and re-education, have been able to undertake work again; nevertheless the signs of pyramidal damage remained unaltered. Another important point is that even in cases that show no improvement the degenerative process in the spinal cord can be controlled so that no further advance occurs.

**REFERENCES.**—<sup>1</sup>*Proc. Roy. Soc. Med.* 1935, xxviii, May, 841; <sup>2</sup>*Guy's Hosp. Rep.* 1934, lxxxiv, Oct., 448; <sup>3</sup>*Proc. Soc. Exper. Biol. and Med.* 1934, xxxi, 706; <sup>4</sup>*Amer. Jour. Med. Sci.* 1934, clxxxviii, Aug., 193; <sup>5</sup>*Quart. Jour. Med.* 1934, xxvii, July, 341; <sup>6</sup>*Amer. Jour. Med. Sci.* 1935, clxxxix, Jan., 115; <sup>7</sup>*Ibid.* 1934, clxxxviii, Oct., 461; <sup>8</sup>*Jour. Amer. Med. Assoc.* 1934, ciii, Sept., 802; <sup>9</sup>*Lancet*, 1935, i, 43; <sup>10</sup>*Ibid.* 448.

**ANÆSTHESIA.** (*See also* ABDOMINAL SURGERY; GALL-BLADDER, SURGERY OF; RECTUM, SURGERY OF; ETC.) *J. Blomfield, O.B.E., M.D.*

**Cyclopropane.**—The most recently introduced anæsthetic, cyclopropane,<sup>1</sup> has received much attention during the past year, although really extensive use is still prevented by lack of production, except in the United States. Cyclopropane is trimethylene, an isomer of propylene ( $\text{CH}_3\text{CH}.\text{CH}_2$ ). It is

heavier than air and inflammable, and explosive in concentrations of from 20 to 75 per cent with oxygen. It is used with high percentages of oxygen, not more than 16 per cent of cyclopropane being required, and generally a percentage considerably below this. It is a potent anæsthetic, the anæsthesia produced resembling that of chloroform, but in rapidity and pleasantness of induction the effects are more like those of nitrous oxide and of ethylene. As cyclopropane has been shown to be also free from deleterious metabolic influence,<sup>2</sup> and is followed by an excellent recovery period, it is obviously an agent of great value. It has been employed with satisfaction for obstetrics.<sup>3</sup> In a report on 350 administrations, of which 206 were for abdominal section, Griffith<sup>4</sup> says that cyclopropane seems to be a safe, controllable, non-irritating, non-toxic anæsthetic, pleasant to take and giving good relaxation. He found vomiting followed about as often as after other gaseous anæsthetics but was never severe. There was no post-operative pneumonia. Experimentally it has been demonstrated that high concentrations of the drug cause respiratory failure before any noticeable effect on the heart. The technique of administration requires closed apparatus with carbon dioxide absorption and large supplies of oxygen.

**Vinethene.**<sup>5</sup>—Experimental studies having suggested that an unsaturated ether combining the chemical characteristics of ethylene and diethyl ether would be a general anæsthetic, pure vinyl ether was prepared after much difficulty. The new ether tested on animals was found to be superior to chloroform and ether as regards physiological and pathological effects. Moreover, it was rapid in action and in recovery and gave good relaxation. This vinyl ether (vinethene) has been tested under the ægis of the Anæsthetics Committee by a number of anæsthetists, who conclude that for human beings it is a good anæsthetic, not irritating to the air-passages, usually provides adequate relaxation, and is remarkably free from after-effects. Owing to its potency, vinethene requires greater care in avoidance of overdose than does ordinary ether, and anoxæmia must be avoided. It is best given by a closed method with oxygen. In this way it has great value as a support to long nitrous oxide administrations. The effect of vinethene on normal and on impaired liver has been investigated.<sup>6</sup> It is found in both conditions to be negligible, but the drug was proved to be an unsatisfactory anæsthetic for dogs.

**Supersaturated Ether.**<sup>7</sup>—Another form of ether is claimed by its German originator to provide an anæsthetic which is absolutely safe, easily administered, and pleasant to inhale. This is the vapour obtained by heating ether far beyond its boiling point. Special apparatus is of course required, which both provides the vapour and allows of its administration (*Fig. 1*). It contains a drop method of supply and is connected with an electric current for the provision of the necessary heat. The patient holds the mask to his own face at the start, and any discomfort is thus notified and the vapour strength lessened till quiet unconsciousness is obtained.

**Ether Convulsions.**<sup>8</sup>—This unfortunate phenomenon remains an unsolved problem for the anæsthetist. The latest suggestion to explain its occurrence is that the symptom should be regarded as a form of heat-stroke. Dickson Wright maintains that by atropine, which prevents cooling by sweat, and by covering the patient's body with rubber sheeting during operation, we do all we can to raise his already heightened temperature. He recommends as treatment energetic cooling measures, especially of the carotid blood-stream, and the use of nambutal as anticonvulsant.

**Explosions in Connection with Ether.**—Valuable information regarding the occurrence of explosions associated with anæsthetic gases, and especially the ignition of these gases electrically, is to be found in the account of a report

read before the Royal Society of Medicine's Anæsthetic Section.<sup>9</sup> In the instance described the explosion was caused by ignition of ether and oxygen, viz., 95 oxygen to 5 ether, and a static spark, either due to passage of oxygen through a metal tube or from the patient's trolley, is assumed to have fired the mixture. The whole question of these explosions has also been before the Anæsthetics Committee,<sup>10</sup> and an article in *The Lancet*<sup>11</sup> may also be consulted.

**Anæsthetics for Children.**—The correct handling of children, especially when very young, is of great importance, for not only is immediate safety easily destroyed, but also by the wrong management the child may be rendered for the rest of his life a risky subject for anæsthesia<sup>12</sup> and a person with an

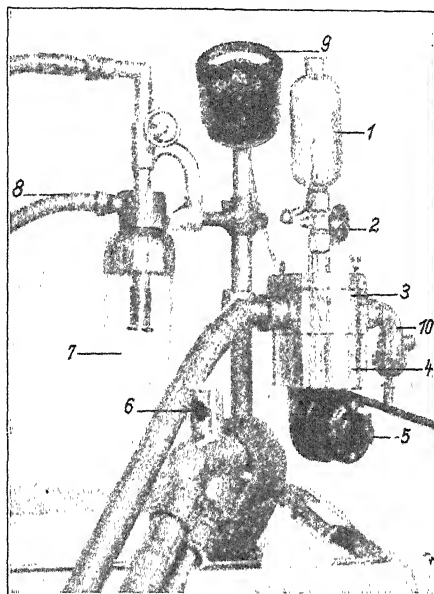


Fig. 1.—Apparatus for administration of supersaturated ether. 1, Ether reservoir; 2, Regulator for ether outflow; 3, Vaporization chamber; 4, Heating chamber with electrical element; 5, Heat regulator; 6, Fresh-air inlet to the mask; 7, Closed expiratory air-valve with water seal; 8, Connecting tube to the water-pump for sucking anæsthetic vapour out of the operating theatre; 9, Electropylometer for measuring the temperature of the floor of the vaporization chamber; 10, Inspiratory air-valve. (By kind permission of 'Zentralblatt für Chirurgie'.)

unnatural dread of everything connected therewith. Much improvement has been brought about since the time when it was taken for granted that the only anæsthetic for an infant was chloroform, the one drug that is now studiously avoided for these subjects. And many lives are thereby saved. An ingenious method is described<sup>12</sup> whereby *nitrous oxide*, recognized as the least dangerous general anæsthetic, may be made available even for the very young. Use is made of the fact that the gas is heavier than air and can consequently be directed on to the child's mouth without any close-fitting mask, and, his attention being diverted in the manner described, sleep without any fears is quietly brought about. Another authority<sup>13</sup> states that for short operations *ethyl chloride*,

and for longer ones *ether*, should always be the anæsthetics chosen. He describes the advantageous use of *paraldehyde* for preliminary medication in the young subjects, and the giving of glucose in powder or liquid form for at least twenty-four hours before operation; or barley sugar may be substituted. The paraldehyde is given rectally, the dosage being 1 drachm for every stone of body weight, dissolved in eleven times the amount of saline. The solution is run in slowly, at least fifteen minutes being taken over this, an hour and a half before the time for operation.

In preference to paraldehyde some, though not most, experts employ *avertin* for children, and its use as a complete anæsthetic for them is also extolled, though general opinion is still against this method. The author<sup>14</sup> recommends a 3 per cent solution allied with morphia and atropine and novocain locally in preference to any inhalation anæsthesia. A plea<sup>15</sup> for increased dosage of *avertin* is advanced on the basis of an experience of 1000 administrations.

The great value of *avertin* in the treatment of tetanus<sup>16</sup> is well illustrated by the account of an instance in which no less than 19.2 c.c. were given in the first eleven days, and 24.4 altogether in twenty-three days, to an infant suffering from tetanus neonatorum who was enabled to recover from his severe attack. Investigations<sup>17</sup> carried out to discover the effects of *avertin* on the renal function show that even in the old these are negligible. Paraldehyde<sup>18</sup> as a preliminary receives strong support on the evidence of 200 consecutive surgical cases. It was given on the basis of 1 drachm per stone of body weight in 12 oz. of saline with 4 gr. powdered acacia per ounce, one to two hours before operation.

**Rectal Anæsthesia.**—A barbiturate for rectal injection<sup>19</sup> as a basic narcotic has given satisfaction to the German authors who are responsible for its introduction. This is known as *rectidon* and is allied to picroton, the bromine-containing barbiturate. A series of 74 men and 56 women were treated with good results. The dose is 1 c.c. per 10 kilos of body weight, given in a small quantity of warm water three-quarters of an hour before the anæsthetic is to be administered. Quiet sleep<sup>20</sup> without excitement or unpleasant sensation is induced. The amount of ether required for operation does not appear to be much reduced, but recovery is excellent with no sickness, two or three hours sleep, and complete amnesia. In one instance only was there excitement during the recovery stage, entirely forgotten, of course, when consciousness was complete. Rectidon is also known as R 239 Na.

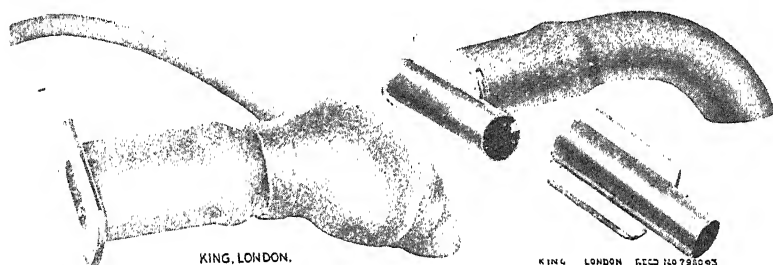
Another method of rectal anæsthesia is recommended by Jacod, of Lyons.<sup>21</sup> This is the combination of ether and oil with *avertin*. He advocates this mixture especially for face and neck surgery, when it is inconvenient to have any anæsthetic appliance near the face. *Avertin* alone, he found, often permitted of local reflexes which inconvenience the surgeon at work on the face. On the other hand, oil-ether alone he disliked for its after-effect and for its induction symptoms. Jacod finds that his mixture of the two gives him the anæsthesia he requires for face and neck surgery. The paper supplies an elaborate table for obtaining the correct dosage. The two anæsthetics are easily combined, as *avertin* is well dissolved by the ether.

**Closed Anæsthesia.**—Closed anæsthesia with carbon dioxide absorption is a method which is gaining more adherents. For success the whole system of patient and machine must be gas-tight. It is pointed out<sup>22</sup> that though a gas-tight machine presents no great difficulty it is a different matter to secure complete absence of leakage between the machine and the patient. Primrose<sup>22</sup> came to the conclusion that the joint could not be efficiently maintained by any means applied to the face. A mask might be used for induction, but other means must maintain the closure of the system on which the recovery principle



depends. Accordingly he has devised a tube which is fitted into the pharynx behind the tongue. At its free end the tube has a cuff or tyre which when distended makes contact with the wall of the pharynx. Being made to expand laterally and corresponding with the general general shape of the throat, it does not open the œsophagus. A difficulty was to find rubber which in a tyre of the small size required would stand the necessary inflation. Moreover, the rubber had to be able to stand boiling for sterilization. The problem has been solved by a rubber produced by the India Tyre and Rubber Co., of Inchinnan. Connected up with the apparatus which is fully described in the article, this arrangement has given the author satisfaction and has provided a non-leaking closed system.

A device similar to that just described has been introduced<sup>23</sup> for intranasal operations (*Fig. 2*). An airway carries a rubber balloon with tube for its inflation. It is lubricated before insertion, and when in position the balloon is distended and the tube clipped.



*Fig. 2.*—Sir Francis Shipway's airway for intranasal operations. (*By kind permission of the 'British Medical Journal'.*)

**Pauses During Operation.**—Crampton<sup>24</sup> draws attention to the fact that a pause for recovery during operations involving severe hurt may be the means of making recovery possible. He gives an example and suggests that the pause for recovery should more frequently be employed during operations of great severity.

**Endotracheal Anæsthesia.**—This is now of course so thoroughly accepted a procedure that not much is written about it, but there is an excellent description of the method and its application in the *Irish Journal of Medical Science*.<sup>25</sup>

**Evipan.**—This continues to be the subject of many articles and is firmly being established as a valuable agent, particularly for short operations and for single-handed surgery. Thus a writer<sup>26</sup> describes its utility in his general practice, for which the small amount of apparatus and simple technique are highly advantageous. He employs no premedication, kneels on the patient's palm while injecting, and injects slowly, i.e., he runs in the first cubic centimetre quickly, and then waits forty seconds before starting on the next, and generally finds 6 c.c. enough for the short procedures. Again, the value of evipan in colonial surgery was demonstrated by several speakers at a French discussion.<sup>27</sup> An expert in general anæsthesia is often unobtainable, the native patient is unfavourable for local anæsthetics, but he is more susceptible to narcotics than Europeans. In 1500 evipan administrations the results were excellent, whether the drug was used as the sole anæsthetic for short operations or as a precursor of ether for long ones. The only danger met with was respiratory depression in the early stages. Natives are especially susceptible to pulmonary

complications after ether. In the course of the discussions several fatalities were recorded for which evipan was held responsible.

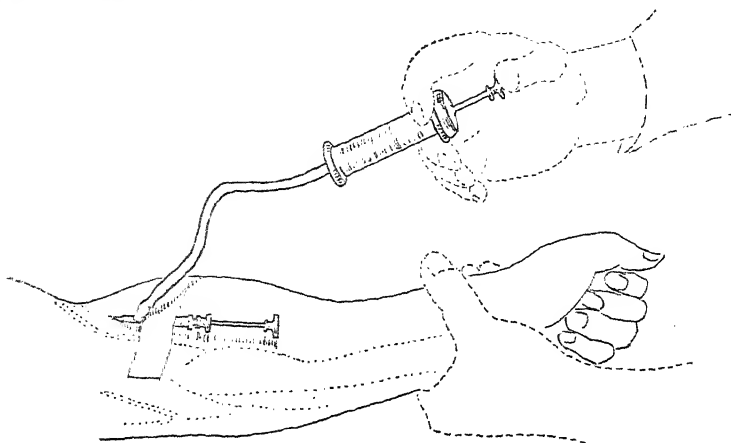


Fig. 3.—Apparatus for prolonged injection of evipan. (By kind permission of 'Bulletins et Mémoires de la Société nationale de Chirurgie'.)

Similarly a German writer<sup>28</sup> describes his experiences of evipan used on the Southern Chinese, who suffer much from chronic diseases, especially malaria. They were people of small size, but he found that the orthodox dosage based on weight was often insufficient. He used the drug successfully for long operations. Fig. 3 shows the device of a French anaesthetist for simplifying prolonged administrations of evipan,<sup>29</sup> and Fig. 4 Mr. Dickson Wright's<sup>30</sup> arrangement for the same purpose.

For *ophthalmic surgery*<sup>31</sup> special advantages are claimed from evipan, one being the lowered intra-ocular tension brought

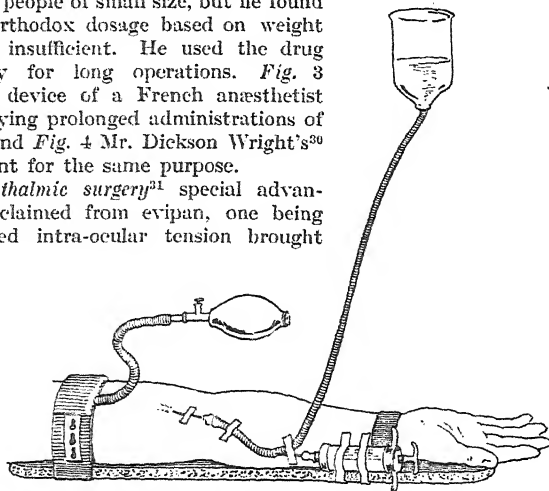


Fig. 4.—Method for prolonged administration of evipan. A sight drip should be inserted in the tube leading from the reservoir. (By kind permission of 'The Lancet'.)

about by the injection. In a series of 86 administrations the authors found no drawback. They found it very suitable for squint operations in children. They employed no premedication. In a later communication, however, they modified this practice, finding that with children a preliminary injection of

omnophon did away with troublesome reflexes. Another authority also refers to reflex sneezing and coughing which he finds militate against the use of evipan for eye operations, as well as jerking of the extremities. He did not find premedication<sup>32</sup> a sure shield against unwanted reflex movements. This observer believes in an appreciable danger in the use of evipan and that it is not free from after-effects. Here the reader may be referred to the report of two French observers who recount a fatal case.<sup>33</sup>

Accidents of the kind are attributed by some authorities to too rapid an injection of the solution. There is some difference on this point in the recommendations of different authorities; some<sup>34</sup> inject the first two or three cubic centimetres quickly and then wait half a minute or more, others inject only at the rate of 1 c.c. every fifteen seconds. On account of the fall of blood-pressure which accompanies injection of evipan, an upright position of the patient, even for dentistry, is objected to except when the patient is young and strong.<sup>34</sup> Evipan is dealt with by the liver, and serious hepatic disease or jaundice is regarded as a contra-indication to the use of the drug, as also is extreme feebleness on the part of the patient, because of the temporary lowering of blood-pressure. Those interested in evipan should peruse the entire discussion at the Royal Society of Medicine.<sup>35</sup>

Gautier<sup>36</sup> relies on a slow progressive attainment of anæsthesia, taking two minutes over the first cubic centimetre and only increasing the rate if at the end of six minutes the patient shows no sign of sleep. He relies on pinching of the skin and the observation of the character of the breathing to know when anæsthesia is present.

Evipan has been used with success to control the spasms of *tetanus*.<sup>37</sup> In the course of eight hours 21 c.c. of evipan were injected. An analysis of 86 operations on patients suffering from *pulmonary tuberculosis*,<sup>38</sup> in whom evipan was the anæsthetic employed enables the author to state that it proved entirely safe. He does not, however, recommend it in preference to inhalation for major thoracic operations. The dosage for minor operations seemed to him to be higher than that required by non-tuberculous subjects.

Remarkable instances of *apparent idiosyncrasy* to evipan are given.<sup>39</sup> In one a young female was unaffected by 14 c.c., and in another a male succumbed fatally to the effects of 7 c.c.

Good examples of the use of evipan in surgery and a discussion of its merits as a *dental anæsthetic* are provided by Marston.<sup>40</sup> An American observer<sup>41</sup> considers that *sodium soneryl*, 1 cgrm. per kilo, in 5 per cent solution, is a better intravenous agent than evipan. His experience is limited to 87 administrations, some of which were for long operations in which ether was used as well. An Austrian authority<sup>42</sup> approves highly of evipan for children's operations, especially orthopædic, and for the application of plaster. He stresses the necessity of steadying the arm during injection. This writer states that there is less rise of temperature after a long operation on a child when evipan is used than after ether.

REFERENCES.—<sup>1</sup>*Brit. Med. Jour.* 1934, Nov. 17, 901; <sup>2</sup>*Lancet*, 1934, July 7, 20; <sup>3</sup>*Ibid.* <sup>4</sup>*Canad. Med. Assoc. Jour.* 1934, xxxi, Aug., 157; <sup>5</sup>*Lancet*, 1935, Jan. 12, 82; <sup>6</sup>*Brit. Jour. Anæsth.* xii, No. 2, 69; <sup>7</sup>*Zentralbl. f. Chir.* lxi, Oct. 6, 2313, and Dec. 15, 2908; <sup>8</sup>*Brit. Med. Jour.* 1935, May 4, 949; <sup>9</sup>*Proc. Roy. Soc. Med.* 1935, xxviii, June, 1128; <sup>10</sup>*Ibid.* 1133; <sup>11</sup>*Lancet*, 1935, March 30, 751; <sup>12</sup>*Liverpool Med.-Chir. Jour.* 1935, xliii, 120; <sup>13</sup>*Med. Press and Circ.* cxxxix, Nov. 7, 411; <sup>14</sup>*Brit. Med. Jour.* 1935, June 1, 1120; <sup>15</sup>*Canad. Med. Assoc. Jour.* 1934, xxxi, Sept. 276; <sup>16</sup>*Lancet*, 1935, Aug. 3, 246; <sup>17</sup>*Ibid.* March 30, 742; <sup>18</sup>*Ibid.* 1934, July 28, 191; <sup>19</sup>*Zentralbl. f. Chir.* 1934, lxi, July 1, 1769; <sup>20</sup>*Munch. med. Woch.* 1934, lxxxii, July 17, 1180; <sup>21</sup>*Lyon chir.* 1935, xxxii, Jan., 35; <sup>22</sup>*Brit. Med. Jour.* 1934, Aug. 25, 339; <sup>23</sup>*Ibid.* 1935, April 13, 767; <sup>24</sup>*Proc. Roy. Soc. Med.* 1934, xxviii, Nov., 91; <sup>25</sup>*Irish Jour. Med. Sci.* 1934, Dec., 654; <sup>26</sup>*Brit. Med. Jour.* 1935, June 15, 1233; <sup>27</sup>*Bull. et Mém. Soc. nat. de Chir.* 1935, lxi, March

22, 396; <sup>41</sup>*Zentralb. f. Chir.* 1934, lxi, Dec. 1, 2770; <sup>42</sup>*Bull. et Mém. Soc. nat. de Chir.* 1935, lxi, April 13, 518; <sup>43</sup>*Lancet*, 1935, May 4, 1041; <sup>44</sup>*Brit. Med. Jour.* 1934, Sept. 29, 590; <sup>45</sup>*Ibid.* 1935, April 13, 702; <sup>46</sup>*Bull. et Mém. Soc. nat. de Chir.* 1934, lx, Nov. 19, 1129; <sup>47</sup>*Proc. Roy. Soc. Med.* 1935, xxxviii, Jan., 341; <sup>48</sup>*Ibid.* and following pages; <sup>49</sup>*Bull. et Mém. Soc. nat. de Chir.* 1934, lx, Nov. 10, 1140; <sup>50</sup>*Canad. Med. Assoc. Jour.* 1934, xxxi, Dec., 617; <sup>51</sup>*Lancet*, 1934, Aug. 11, 308; <sup>52</sup>*Edin. Med. Jour.* 1934, xli, Nov., 615; <sup>53</sup>*Med. Press and Circ.* 1934, clxxxix, Sept. 5, 211; <sup>54</sup>*Surg. Gynecol. and Obst.* 1934, lix, Aug., 182; <sup>55</sup>*Wien. klin. Woch.* 1935, April 26, 529.

## ANAL FISSURE.

J. P. Lockhart-Mummery, F.R.C.S.

This is an extremely painful complaint, and one of the difficulties of treating it successfully is that quite often the parts are so tender and sensitive that the patient will not allow an adequate examination to be made. This difficulty can be got over by injecting a small quantity of a 2 per cent solution of novocain into the tissues posterior to the anus with a fine hypodermic needle inserted through the skin  $\frac{3}{4}$  in. behind the anal margin. This should render the parts insensitve and enable a proper examination to be instituted. If the fissure only consists of a small crack or tear at the posterior commissure, healing can usually be secured without any operative interference, but if there is a deep indurated ulcer, with hard edges, and a sentinel pile, palliative measures are useless and operation is the only remedy.

### TREATMENT.—

*Palliative Measures.*—The patient should be given a suitable aperient, preferably combined with liquid petroleum in some form or another, so as to ensure that the stools are quite soft and unformed. The bowels should be opened if possible before the patient has a bath, and the latter should be taken immediately after stool. After this the patient should apply some such ointment as hydrochlor. cocaine, 6 per cent, in vaseline, and lie down on the bed for fifteen minutes.

A very good plan which has met with considerable success is to inject the nerves passing to the sphincter and the mucous membrane posteriorly with *proctocaine* solution. About 5 to 8 c.c. of the solution is injected with a large needle guided by one finger in the rectum, the needle being passed through the skin externally at a point previously anæsthetized by injecting 2 per cent novocain. The injection is made as close as possible to the main nerves. This renders the parts quite insensitve for from a week to ten days and gets rid of the pain. Thus the fissure can be treated by the application of weak nitrate of silver or some other medicament, and healing will usually occur quite readily. Proctocaine consists of: procaine 1.5 per cent, alcohol benzyl 5 per cent, butyl-*p*-amino-benzoate 6 per cent, in oil. This is put up in 5-c.c. sterilized ampoules.

*Operative Treatment.*—When the fissure is a large one or fails to respond satisfactorily to the above treatment an operation should be performed. Under local or a low spinal anæsthetic the sphincter muscle should be gently stretched and the fissure cut out, leaving a shallow wound of which two-thirds is situated on the skin. The sphincter muscle should not be divided at all. It used to be taught that division of this muscle was necessary to secure healing of a fissure, but this is not so, and quite good healing will occur without damaging the sphincter muscle. The small wound should be dressed twice daily with cotton-wool applied dry and afterwards soaked with castor oil. The patient should lie up until healing is quite completed.

## ANAL FISTULA.

J. P. Lockhart-Mummery, F.R.C.S.

Two important papers have appeared during the year dealing with this subject. E. T. C. Milligan and C. Naunton Morgan,<sup>1</sup> as a result of a careful research into the exact anatomy of the musculature of the lower end of the rectum, have

given certainly the best and most accurate description of the arrangement of the muscles in this region that has yet appeared. It need hardly be pointed out that an exact knowledge of the anatomy of this region is of primary importance to the rectal surgeon who is called upon to deal with a case of fistula. The authors have demonstrated that the external sphincter is a more complicated structure than is generally supposed. They divide it into three parts: (1) The subcutaneous external sphincter; (2) The superficial external sphincter; and (3) The deep external sphincter. The first and third portions of the muscle are annular muscles, supplied by the inferior hæmorrhoidal nerve, while the second portion is elliptical, is attached to the coccyx, and is supplied by the perineal branch of the fourth sacral nerve.

These authors suggest the following classification for fistula in ano: (1) Subcutaneous and submucous; (2) Fistula where the main track enters the anal canal below the ano-rectal ring; (3) Fistula with the main track extending above the ano-rectal ring. This classification has at least the merit of being simple and distinguishing between the main varieties as regards treatment. The authors advocate the two-stage operation in all those cases where laying open the main track into the rectum might involve division of the muscles forming the ano-rectal ring.

A very interesting paper on the causation of fistula in ano was published in April by Sir Charles Gordon-Watson and Harold Dodd.<sup>2</sup> The authors bring forward a considerable amount of evidence in favour of the view that many cases of ischio-rectal abscess which subsequently result in fistulæ are caused by suppuration of the intramuscular glands. These glands appear to be the remnants of the odoriferous glands which have an important rôle in most mammals as a sex attraction. It is the suppuration of these glands which is the common cause of abscesses in toy dogs, such as Pekinese and King Charles spaniels. Histologically these glands are lined with transitional epithelium and their structure is similar to other convoluted mucous glands. They are found situated in and outside the muscular walls of the rectum and they communicate with the lumen of the bowel by narrow openings. The authors have been able to show, at any rate in some cases, that these glands have been the cause of abscess formation and fistula. Thus they have demonstrated that part of the fistulous track after being excised was lined with epithelium similar to that usually seen in these intramuscular glands. The inference would seem obvious that it is always advisable when possible, without jeopardizing the integrity of the muscular mechanism at the anal opening, to excise the whole of the fistulous track completely, as healing is not likely to be very satisfactory if part of the wound is lined with epithelium.

REFERENCES.—<sup>1</sup>*Lancet*, 1934, ii, Nov. 24, 1150, and Dec. 1, 1213; <sup>2</sup>*Brit. Jour. Surg.* 1935, xxii, April, 703.

### ANEURYSM, AORTIC.

A. G. Gibson, M.D., F.R.C.P.

T. Thompson, H. S. Souttar, and L. Howells<sup>1</sup> report a successful operation on a patient with an aneurysm of the descending arch of the aorta. A man, aged 51, two days after having been struck by his employer, began to get pain in the chest. A swelling occurred at the site of the blow and he began to bring up tenacious sputum with cough. There was severe pain on the left side of the chest which passed round to the left shoulder and left scapula. There was no enlargement of the heart, the trachea was slightly displaced to the right, and there was diminution of breath-sounds over the left upper lobe suggesting pressure upon the left bronchus. The knuckle of the aneurysm was clearly marked in the X-rays. Treatment by novarsenobillon made no definite improvement and there was some increase in size in the aneurysmal

shadow. An operation was undertaken under local anaesthesia, and a *Colt's wire umbrella* was inserted from the cannula into the aneurysm. This was followed by a great improvement in the condition of the aneurysm, the swelling retracted, the redness of the skin disappeared, and the cough improved. Three years after the operation the man was able to work for eleven hours a day and felt well. X-rays are given showing the *Colt's umbrella in situ* in the aneurysmal sac.

REFERENCE.—*Lancet*, 1935, i, 11.

**ANGINA PECTORIS.** (See also CORONARY ARTERY DISEASE; HEART FAILURE, THYROIDECTOMY IN; THYROID SURGERY.)

A. G. Gibson, M.D., F.R.C.P.

L. N. Katz, W. Mayne, and W. Weinstein,<sup>1</sup> in observations on dogs, find that the occlusion of a carefully isolated strip of coronary artery caused no painful response, but this was obtained when the undissected coronary vessels above and below were compressed. Destruction also of the nervous plexus with phenol and alcohol abolished the response to compression in the area of the destroyed plexus. There was no painful response to increase of pressure in the pericardial sac, though this was followed by syncope. It is concluded, therefore, that ischaemia of the myocardium is one of several mechanisms which may operate on nerve-fibres and nerve-endings to produce anginal attacks.

In a British Medical Association Lecture, G. Bourne<sup>2</sup> classifies cardiac pain under four headings: (1) Quantitative pain of angina of effort; (2) Spasmodic pain (spasmodic angina); (3) Continued pain (coronary occlusion); and (4) Pain having no specific relationship, otherwise called 'pseudo-angina' or 'angina innocens'. In regard to the first type, the pain may be noticed in the first instance only after a meal, though if exercise is taken soon after, the quantitative relation persists. The reason for its presence during a meal has probably to do with the increased cardiac output. The amount of dyspnoea gives some indication of the extent to which the myocardium is involved, and it is desirable to ascertain whether it is pain or shortness of breath that pulls the patient up. Those with low nervous thresholds for pain do not complain of dyspnoea first. This type is probably due to partial obstruction. It may also be seen in syphilitic aortitis and in severe anaemia such as pernicious anaemia. An attack of coronary thrombosis is often the starting-point for a subsequent period of angina of effort. In spasmodic angina the onset is sudden, the degree of pain is maximal during the first minute of the attack, and there is frequently a sensation of impending death, though no fear of death may be present owing to the agony of the pain. The pain is agonizing, strangling, constricting, or tearing, but less severe than in some cases of coronary thrombosis. During the attack the patient is pale, anxious, and remains still. Sweating is frequent. The patients are often of the nervous type, and there is an association between this form and the spasm of peripheral blood-vessels. In this form also there is a dramatic effect with antispasmodic drugs.

In speaking of syphilitic cardiac pain Bourne recognizes the angina of effort, spasmodic angina, and nocturnal pain. In patients with syphilitic aortic regurgitation angina of effort and spasmodic angina may be found. The disappearance of cardiac pain may suddenly occur on the advent of auricular fibrillation. Sometimes also the sudden attacks of pulmonary congestion and paroxysmal dyspnoea seen in advanced mitral stenosis are accompanied by cardiac pain. This is vaguely increased by exertion, but there is no clear relationship.

A. M. Webb and R. E. Smith,<sup>3</sup> in analysing 166 patients who complained of angina of effort in regard to prognosis, find that nearly one-third of the patients had died suddenly and over half had died from coronary occlusion.

The average duration of life was 5·8 years. They note that the prognosis in the individual case must be uncertain and the angina of effort may exist for many years; in one case recorded it had existed for twenty-four years. Cardiac or vascular disease was responsible for death in over 80 per cent of the series. The mean age at which pain first appeared was 57·5 years and the mean age at death was 63·3 years.

In an account of the management of the patient with anginal pain R. L. Levy<sup>4</sup> suggests that cardiac pain is a symptomatic expression of a disturbed functional state and is most commonly seen when the heart muscle does not receive an adequate supply of oxygen. In the normal heart there is a ratio between the oxygen supply and the capacity for work which varies between certain physiological limits, and this may be disturbed either by cutting down the amount of oxygen which reaches the heart muscle or by increasing the amount of work called for by the heart. On this conception he proposes classification of the conditions which may be confused with angina pectoris: (1) Disease of the coronary arteries, which may be arteriosclerotic, syphilitic, or rheumatic; (2) Aortic insufficiency; (3) Anæmia; (4) Hyperthyroidism; (5) Paroxysms of tachycardia; and (6) Combined states, in which slighter degrees of the former categories may combine to produce symptoms. In non-cardiac and paroxysmal chest pain he emphasizes the importance of excluding psychoneurotic states, poisoning by tobacco or coffee, aneurysm of the aorta, pericarditis, and arthritis of the spine. This subject is also the substance of a paper by D. Scherf,<sup>5</sup> who includes amongst the conditions which produce serious cardiac pain those with mitral and aortic stenosis and those with crises of blood-pressure that occur as originally suggested by Pal in hyperpiesis, lead poisoning, eclampsia, and uræmia.

REFERENCES.—<sup>1</sup>*Arch. of Internal Med.* 1935, lv, 760; <sup>2</sup>*Brit. Med. Jour.* 1935, i, 1109; <sup>3</sup>*Amer. Jour. Med. Sci.* 1935, clxxxix, 690; <sup>4</sup>*New Eng. Jour. Med.* 1934, ccxi, 392; <sup>5</sup>*Wien. klin. Woch.* 1935, xlviii, 577.

## ANKYLOSTOMIASIS. (See also BLOOD DISEASES.)

*Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

INCIDENCE.—The prevalence of hookworm infection in two villages of a rural area of the Punjab is reported on by M. Yacob and J. R. Chaudri.<sup>1</sup> The stools were examined by the direct centrifugal flotation method for ova, and counts made by a modified Stoll method. Of 150 persons, 82 per cent showed infection, with an average egg count of 422·7 per grm. of fæces, and an infection index of 136·2. Of 119 infected persons, 12·7 per cent had no symptoms, 39·5 per cent moderate, and 47·8 per cent severe symptoms in relationship to the egg counts. Male cultivators up to 40 years of age suffered most. No latrines were available, and the main defæcation sites were the village footpaths.

A simple method of growing hookworm larvæ without any need to trap the cultures is described by P. A. Maplestone.<sup>2</sup> He makes a gauze basket with a square base 6 cm. by 6 cm. and 108 c.c. capacity, in the bottom of which glass beads or coarse-grained sand is placed and covered by about 50 c.c. of fine sand free from larvæ, etc. After making a shallow depression in the sand, 8 c.c. of prepared earth and 4·4 c.c. of diluted stool are put in it, and the cage is then placed in an aluminium inverted cone standing in a Petri dish so that the water in the dish does not come into contact with the culture. After culturing for a week the basket is stood in a funnel clamped below containing water up to the lower part of the basket, into which the larvæ pass within twenty-four hours, when the fluid can be run off and counts made on two successive days.

J. F. Kendrick<sup>3</sup> deals with the rate of loss of hookworms from the intestines in 25 persons protected from further infection by good hygienic conditions in a Madras jail, and who volunteered to be infected through the skin or orally with hookworm larvæ. They found that an average of fifty-three days elapsed after application of larvæ to the skin before ova were found in the stools by weekly examinations. Subsequent studies for three to five years or more showed that the ova output gradually increased, to reach its maximum in twelve to eighteen months. They then declined by 50 to 70 per cent during the next three to six months, and disappeared in an average of seventy-six months. A. C. Chandler<sup>4</sup> also returns to this question, taking into account the considerable seasonal variations due to low infection rate in the dry season. He now finds the time of the most marked increase in egg output after infection to be six months, not two months as formerly thought, but it falls off again during the next six months. Mass treatment is most effective when the ground is most free from larvæ in the dry season.

The direct development of hookworms after oral infection is dealt with experimentally by A. O. Foster and S. X. Cross,<sup>5</sup> who made œsophageal fistule in dogs to prevent larvæ making their journey through the lungs, which some Japanese authorities consider to be essential for the completion of their development. Using *Ancylostoma caninum* they found that the larvæ orally administered do not migrate, but develop directly in the intestine.

TREATMENT.—*Tetrachlorethylene* and oil of *chenopodium* have been carefully tested on an Assam tea estate by D. Manson,<sup>6</sup> the former being employed in 3- and 4-c.c. doses, and the oil of *chenopodium* in a 3-c.c. dose, or 1 c.c. with 3 c.c. of the other drug. After a trial of the tetrachlorethylene in 100 cases had shown it to be non-toxic except for a slightly intoxicated feeling, which the coolies rather appreciated, 300 cases of hookworm infection were treated and the results tested by egg-counting methods. The 4-c.c. doses of the first-named drug were well tolerated and gave better results than 3-c.c. doses, and the combination of the two drugs gave nearly as good effects as regards hookworms, but the oil did best against round-worms. The conclusion is arrived at that 4 c.c. of tetrachlorethylene is safer than and preferable to similar doses of carbon tetrachloride, and it is suggested that 1 c.c. of oil of *chenopodium* might be added to the newer drug with safety and advantage.

REFERENCES.—<sup>1</sup>*Ind. Med. Gaz.* 1934, lxix, Sept., 500; <sup>2</sup>*Ind. Jour. Med. Research*, 1934, xxii, Oct., 203; <sup>3</sup>*Amer. Jour. Trop. Med.* 1934, xiv, Sept., 363; <sup>4</sup>*Ibid.* 1935, xv May, 357; <sup>5</sup>*Ibid.* 1934, xiv, Nov., 565; <sup>6</sup>*Ind. Med. Gaz.* 1934, lxix, Sept., 500.

## ANXIETY AND DEPRESSIVE STATES. H. Devine, M.D., F.R.C.P.

**Anxiety: its Nature and Treatment.**—H. Harris<sup>1</sup> has written a lengthy study on this subject. His summary and conclusions are as follows:—

The psychiatrist is concerned with four moods or affective-emotional states and their permutations and combinations. These four moods may be considered in terms of conflict: anxiety as unsolved conflict, elation as solved conflict, depression as unsolvable conflict, apathy as the most complete solution of conflict. Conflict may be considered in terms of the tensions interacting to cause conflict and the balance between such tensions. In anxiety the tension is a rising one, in elation it is a falling one, in apathy it is low and is continuously being discharged, in depression it is extremely and continuously high and amounts to a sort of spasm. In this paper it is suggested that in our present state of knowledge these tensions may reasonably and profitably, if somewhat speculatively, be considered to be metabolic, visceral, and autonomic tensions. The interpretation of anxiety as an energetic problem, due to metabolic, visceral, and endocrine hypertensions, leads the writer to formulate a plan of treatment



in general terms : (1) The problem at hand must be resolved clearly into terms of anxiety. This may be very simple, or may require the full resources of the psycho-analytic technique. (2) An adequate outlet, not conflicting with social demands, must be found for the energy that is bound up in the anxiety ; that is to say, for the segment or instinctive activity under greatest tension. (3) Failing this, the individual must be 'cotton-woolled' and spared anxiety-producing and tension-increasing stimuli. (4) As a last resource, 'supportive' treatment must be used to combat anxiety which is completely unavoidable ; this, by diminishing the total energy of the individual, relieves the painful hypertension of individual segments or viscera. Of the four steps in treatment, the last two are far from ideal, but, under present conditions, are often enough the only methods available. In any case, it is unwise to despise or neglect anything that may help to diminish the particular form of anxiety and conflict that is doomed to lead nowhere ; for the problem of anxiety is after all the problem of unhappiness.

**Depression : Normal and Abnormal.**—H. W. Eddison<sup>2</sup> writes on this subject from the psycho-analytical point of view. He aims especially to submit some suggestions regarding the function of depression and the psychic mechanism whereby it is brought about. The following is a summary of views : (1) The stimulus-free state is rejected as a goal. (2) Individual organisms in an organized group exhibit as a whole the same adhesive tendency which their component cells share in common (Trotter). (3) The primary group is the mother and child who, from the point of view of the child, form one organism. (4) The child is happy when its union with its mother is not disputed. Its troubles begin when the mother puts it down or something goes wrong with breast-feeding. Union with the mother represents pleasure and continuity of the cell-mass. Tearing the child from its mother constitutes pain and a wound in the cell-mass of which both form a part. At first the mother and later the father are instrumental in causing pain. (5) Weaning assumes traumatic importance, and the wound caused by such a painful excision can only be healed, in the case of a boy, by obtaining a mother substitute. In marriage the twain shall become one flesh. (6) Depression and hate are aroused whenever pain is produced. Both occur normally at weaning, and again at the anal stage. The education of the sphincters, forcing the child again to part with what it regards as a portion of itself, reopens the wound of weaning. (7) Normal grief in adult life represents a regression to the oral stage. Without grief and its regression, healing of the reopened wound is not possible. When a loved one is lost, readjustment is only possible by starting again at the beginning, at the oral stage. This is seen also in physical disease when a placebo is demanded in order to heal the external wound (disease) in the ego. The meaning of the oral approach in love-making and the function of the kiss become apparent. The completeness of the regression is sometimes shown by involuntary movements of the buccal muscles accompanying kisses. (8) In response to an external danger the source of the threat is invested with hate, while the external defensive barrier is reinforced by apprehension. Similarly, with regard to a threat from within, anxiety reinforces the internal barrier. (9) Melancholic grief originates from fixation at the oral stage. (10) Normal grief represents regression to the oral stage, at which crying is a natural reaction to separation from the mother or to other injuries. (11) The anxiety which precedes the melancholic attack reinforces the barrier against stimuli from within. The melancholic attack follows rupture of the internal barrier. Attempts at transference fail and the wound of weaning is reopened. The self-reproaches are directed against the mother, who, once an external threat, is now, through introjection, an internal threat. (12) With regard to the

(Edipus situation, a man heals the wound of weaning by choosing a mother-substitute and so retains his mother. It is suggested that in the case of a girl primary masochism prompts her to invite the injury of weaning or, rather, the reopening of the wound. She thereupon identifies herself with the lost love-object, i.e., her mother, by a melancholia-like reaction. This is supported by the idea, once common among unmarried women, that marriage involves some vague, undefined suffering.

**The Syndrome of Neurotic Anxiety.**—Walter Misch<sup>3</sup> summarizes his views as follows: As a state of neurotic anxiety is not to be influenced by the usual pharmaco- and psychotherapy, an attempt was made to find out the genesis of this state of anxiety. It was found that at the beginning of the illness it is always possible to find the 'major anxiety attack' which is composed of a number of vasomotor sensations, tachycardia, and intense paralysis of the motility and of the psychic apparatus, combined with acute fear. Such attacks are very seldom to be observed because the patient cannot move during the attack, and, besides that, does not speak about it. They rarely occur in the same patient again with the same violence, since, as the anxiety is unbearable, mechanisms of defence are mobilized at once. Owing to these latter there arise the modified syndromes of 'agitated anxiety attacks', of the 'chronic anxiety state' with exacerbations, and with incidental graver attacks, and the 'anxiety equivalents' of Freud. Clinically, one has to differentiate the anxiety neurosis, in which the anxiety overtakes the patient like an infectious disease, and in which neurotic symptoms are not to be observed in the intervals, and the anxiety hysteria, in which the hysterical disposition can be demonstrated, and the attacks are determined by psychical processes (e.g., are caused by suppressed aggressions).

The investigations started with the anxiety neurosis, and especially the major anxiety attack. In the latter case the somatic anxiety syndrome is most clearly developed, and is composed of intense vasoconstriction of the skin (paræsthesias, sensation of cold, pallor), tachycardia up to 150, inhibition of salivation, cold sweating, mydriasis, arterial hypertony up to 150 mm. (of mercury), and an intense relaxation of the voluntary muscle system. This syndrome indicates a stormy excitation of the sympathetic system, which may be combined at the end of the attack with parasympathetic phenomena. It was found that this syndrome could be removed by *choline preparations*, which by their stimulating effect on the parasympathetic nerve produced in effect exactly the opposite to the anxiety syndrome: by an intramuscular injection of 0.1 c.c. acetylcholine the anxiety attack can be stopped also in its psychical effects, and even chronic anxiety attacks can disappear after a few days by oral administration of the choline preparations *pacyl*\* or *hypotan*\*. It appeared that the effect of choline is greater if the anxiety experience is more elementary, and smaller if the anxiety is worked through in a psychical manner.

The removal of anxiety by a drug with only a peripheral action led to the supposition that the fear of an anxiety neurosis arises primarily in a somatic way. Various clinical and experimental observations led to the hypothesis that the vasoconstriction of the skin plays an important part here (vaso-neurotic anxiety), and that the character of the anxiety syndrome, corresponding to the adrenalin action, may be traced back to a primary action of the adrenal glands. Since in all cases observed there was found some sexual damage, such as the inhibition of normal relief, and since the anxiety could be removed both by the prevention of this and by choline medication, this confirms Freud's

\* Roberts & Co., 76, New Bond Street, London, W.1.

theory of the damming up of libido, and Reich's theory of the origin of anxiety being due to a sympathetic-toxic action of the sexual hormone.

The fact of peripheral somatic removal of anxiety seems to have great theoretic importance for the question of the relation between psychic and somatic events in anxiety. Clinical observations showed that in an anxiety neurosis the vasoconstriction of the skin is of primary significance—a phenomenon which is understood as the 'barrier syndrome'. The psychic correlation to this is experienced in the anxiety attack as a loss of connection with surroundings, and this experience is the origin of the feeling of annihilation in the anxiety attack, as K. Goldstein has proved in the anxiety in cases of brain injury. The fear of death which is experienced in the anxiety attack is understood to be the experience of threatened loss of identification by the ego which becomes realized by means of the objects.

The heart neurosis described by Max Herz as phrenocardia, which not only shows the same somatic syndrome as the anxiety neurosis, but at the same time is traced to unsatisfied sexuality, allows the supposition that this disease is a kind of 'anxiety neurosis without anxiety', and that therefore the pathogenic agent is here worked through psychically in a different way from that of the anxiety neurosis. In order that anxiety should arise there must then be, apart from the somatic events, also a psychic readiness through the individual structure of the personality. In neurotic anxiety conditions there is a reciprocity between soma and psyche, the common somatic condition being a state of sympathetic excitation, the common psychic condition being the anxiety experience. Choline treatment removes the somatic experience from the psyche where it was worked through as anxiety, and in this way a vicious circle which usually cannot be interrupted by action on the psychic factor is interrupted by action on the somatic factors.

The somatic genesis of neurotic anxiety can be designed in the following way: There is always a disturbance of the course of sexual irritation to be found. This disturbance results either from sexual abstinence caused by external or neurotic reasons, or from neurotic sexual hypo-aesthesia while relatively great libido is present, and leads, with a certain sympatheticonic disposition, to a strong excitation of the sympathetic system. At this point the mechanism can be interrupted by choline medication. According to the working through of the state of sympathetic excitation there results either the syndrome phrenocardia, or, with corresponding psychic preparedness, the anxiety neurosis. If this continues for some time it can become fixated and psychically worked through so that anxiety can then also be issued by the psyche.

It was possible to ascertain in nearly all cases that the ailment had started with an actual anxiety neurosis, and that by drug treatment or abolition of the sexual disturbances, one can prevent the manifestation of the psychoneurosis. The somatic neurosis only lasts for a certain time, some weeks or months, and then becomes built over in a psychoneurotic manner so that then it may only be treated by a long-continued psychotherapy. In the cases of anxiety hysteria this psychoneurotic projection is existent from the beginning and is to be treated by psychotherapy. Psychotherapy, then, has to treat the neurotic sexual abstinence and hypo-aesthesia as sources of anxiety neurosis, and its secondary fixation.

**Involution Melancholia.**—A. W. Werner, G. A. Johns, E. F. Hoctor, C. Ault, and L. Kohler<sup>4</sup> are responsible for an investigation on the probable etiology and treatment of involution melancholia. This malady occurs in both sexes. The age incidence is earlier in women than in men, occurring between 40 and 50 years in the former, and usually after 50 years in the latter. The consensus of opinion is that involutional melancholia constitutes between 3 and 4 per

cent of all mental disease. Most writers agree that no acceptable organic pathologic changes of the central nervous system have been demonstrated.

There seems to be a failure of these patients to adjust themselves to the stresses and strains incident to this period of life, when the endocrine glands, especially the reproductive glands, decline in function, with consequent changes in the chemical, metabolic, and vegetative activities of the body.

The writers do not deny the existence of psychological factors, but they feel that a more fundamental causal factor probably exists which unstabilizes these patients and allows this mental disorientation to manifest itself. They feel, furthermore, that they have secured sufficient evidence by controlled clinical research to justify the belief that involuntional melancholia yields to treatment, thereby giving presumptive evidence for accepting an endocrine basis for this condition. The writers point out that about 40 per cent of patients with involuntional melancholia recover. Convalescence, however, is slow and those who recover are frequently ill for two or three years.

**TREATMENT.**—The treatment recommended by leading writers is of a negative character, such as guarding the patient against self-destruction, rest and quiet, sufficient sleep, maintenance of strength by nourishing food, and sedatives for nervousness and agitated states. The treatment as outlined is necessary, but it does not strike at any specific cause of the condition. As a result of their physiological researches the writers have felt that active treatment of a specific nature should be given in these conditions. They have therefore been led to treat a number of cases by injections of *theelin*, and they believe this to be a rational procedure, as the results seem to indicate. The dosage of 1 c.c. of theelin was decided on arbitrarily, and it was felt that larger doses would produce more rapidly beneficial effects. Werner and Collier have shown that the clinical results obtained by theelin administration are dependent on the size of dosage and the duration of administration. The time element is an important factor in recovery. While apparently remarkable response is had within the short time of one or two months in an occasional case, this is not the rule. When a favourable response is manifested, the improvement is gradual and continuous, in contrast to the apparently slow improvement and regressions of patients previously treated palliatively and expectantly. Cases showing marked improvement are kept in institutions with difficulty, for the patients wish to return home when they feel more normal and the relatives are anxious to have them at home for obvious reasons. When these patients become more rational, it is the consensus of opinion that most of them will do better under normal routine home life. However, their supervision and treatment with theelin should be continued at home under the care of the family physician for a period of one or two months after being symptom-free to assist stabilization. If, after the patient has been off treatment, the condition should give evidence of recurrence, treatment should be reinstituted to prevent a relapse to the previous degree of mental incapacity. It might be well to give theelin to women who manifest severe menopausal symptoms and not wait for the more serious mental illness to overtake them.

**Method of Procedure.**—This experiment is being conducted at the St. Louis City Sanitarium and at Missouri State Hospital No. 4, Farmington, Mo., where a combined series of forty-one patients with involuntional melancholia are under treatment and observation.

To obviate the objection of some physicians who state that involuntional melancholia is a psychosis and that these women would recover if physiologic solution of sodium chloride had been injected, so long as the patients thought that something was being done, they were paired, and one half of the number were given 1 c.c. of theelin intramuscularly daily, and the controls were injected

with 1 c.c. of physiologic solution of sodium chloride daily. So that an honest and fair comparison of the results of treatment could be had, the patients were paired as nearly as possible according to the severity of their mental condition. In other words, they were classified and paired as having excellent, good, fair, or poor chances for recovery.

**Conclusions.**—Forty-one patients with involuntional melancholia are being treated from an endocrinological point of view. Twenty-one of these women are being given 1 c.c. of theelin intramuscularly daily. The others are being used as controls but will be given theelin later. The improvement in the theelin-treated patients has been greatly accelerated by the use of this hormone. The more rapidly beneficial results obtained in the theelin-treated patients seems to indicate that the administration of this hormone is rational and strikes at the fundamentally causative factor.

**Depression with Tension.**—W. Muncie<sup>5</sup> describes what he calls depression with tension. Tension the patient describes as a feeling of being taut under strain and unable to relax, and it finds expression in statements of dissatisfaction, discontent, and in restless, anxious attitudes. The special physiological manifestations belong in part to the phenomena of autonomic imbalance, with evidence of sympathetic preponderance. There are anxiety symptoms referred to the heart. There appear to be definite precipitating factors in an intolerable, or at least not accepted, situation. The condition is usually prolonged, and often leaves residuals in the nature of hypochondriac or apprehensive invalidism. Treatment is difficult, because the patient is unable to arrive at a consistent working agreement with the environment, and to face his problems with decision. The author finds the continuous bath, together with barbitol in small doses (2.5 gr.) two to four times a day, helpful.

**Prevention of Anxiety States.**—In a paper on anxiety Elizabeth Sloane Chesser<sup>6</sup> refers especially to the question of prevention of anxiety which is so important to mothers, physicians, teachers, and psychologists. Briefly it is concerned with the following factors: (1) Training of the infant; (2) Good discipline for the young child; (3) The inculcation of more and more independence in the school and college phase in order to achieve a self-reliant, responsible, self-confident adult human being.

Infant training comprises the inculcation of good physical habits, because body health has far-reaching influence on the mind and the emotions through the whole of life. The child's environment should be quiet. This to town-dwellers especially is a serious problem in this age of noise and excitement. The nursery must, however, be a quiet and sunny room. The human being has a wonderful faculty of adapting to environment, so whilst loud noises which we associate with motor-cars are not desirable from any point of view, they must, for the moment, be accepted by parents. In the case of nervous children, double windows in the nursery may be considered.

The emotional tone of the home affects children even in infancy. The family doctor may feel compelled to advise more harmony, less conflict between parents or other members of the household. Discord in the home tends to make children 'anxious'. It is becoming a commonplace to the psychologists that anxious children—problem children—have frequently nervous problem parents. Peace in the home helps to prevent nervousness and apprehension amongst children, thus promoting mental hygiene.

The second point is concerned with 'good' discipline. Without harshness or unkindness, the nursery child must be disciplined. He must be trained to be punctual, tidy, obedient. Unpunctuality is a source of anxiety to many people, tidiness suggests mental control, and willing obedience to wise authority as distinct from fear-obedience is a desirable quality in anyone.

The third factor in the prevention of anxiety is associated with better education during the school phase. Training of the child towards independence, self-reliance, and a sense of responsibility should be the aim of teachers and physicians. Different types of children require different methods. In some cases encouragement is essential; in others such punishments as deprivation of certain pleasures or foods or earlier-to-bed have a good effect. The writer is entirely against corporal punishment, and anything which frightens a child. Irreparable damage to the nervous system is inflicted by unimaginative, stupid adults with the best motives in the world. Tasks should not be too difficult, whether mental or physical, for the period of life of the child. There are better ways of teaching children to swim than by throwing them into the water or 'dooking' them over the head.

Botany, often so boring in the schoolroom, can be made an interesting hobby, a lifelong enthusiasm, by any teacher who knows how to teach, to arouse interest, walking through the woods and fields of the countryside. Children should not be punished for irresponsibility or cowardice; they should rather be encouraged to take care of younger children and animals, and to talk freely of what they are afraid without the risk of parental disapproval or adult ridicule.

Children must be gradually trained to independence and responsibility by being given more freedom and certain duties, which should be made as interesting as possible. A human being gains courage and self-confidence by overcoming difficulties.

**The Practical Features in the Study of Anxiety States.**—Esther L. Richardson<sup>7</sup> observes that one of the most common symptom-pictures of nerves is that which is comprised in attacks of dyspnoea, palpitation, sweating, vertigo, precordial discomfort, and often gastro-intestinal manifestations, with the predominating emotional accompaniment of apprehensiveness—a vague fear of something going to happen. Its force is best described in the term *Angst*, or anxiety. Little attention was paid to the observation till 1909 when Freud described the same condition and labelled it 'anxiety neurosis'. It is interesting to note that anxiety attacks show a marked increase in mass health during periods of mass excitement and worry for any reason. For example, in 1918 and 1919, during the influenza epidemic, these cases were very, very common in private and dispensary practice. They were termed 'post-flu hearts' in those days. But we may well ask ourselves how much of this symptomatology was due to actual influenza heart damage, and how much of it was associated with a high pitch of emotional excitement due to an epidemic that rivalled the black plague in its mortality rate. During the year 1926, when the American was sitting comfortably on an inflated economic foundation, there were registered only 80 of these patients in the dispensary of the Henry Phipps Psychiatric Clinic of the Johns Hopkins Hospital. In 1932, when the country began to feel the pressure of deflation, 232 cases of anxiety states were registered at the Clinic.

It would, therefore, seem reasonable to study the symptom-complex of anxiety attacks to see what lies behind in the rank and file of cases. The complaints of palpitation, fluttering, giddiness, heart turning over, sinking spells, shaking, sweating and flushing, weakness, constriction in the chest, pain around the heart, substernal pressure, shortness of breath, tightness in the throat, fear of being alone, etc., are symptoms with which we all are familiar in states of fear. The receipt of bad news, the necessity of speaking in public, the finding of ourselves in situations of danger, call forth in each of us these physiological manifestations of fear. Cannon, of Harvard, has described for us in detail what fear does to animal physiology. We pay no attention to these distressing cardiovascular and respiratory and gastro-intestinal body protests because

they seem to be a reasonable accompaniment to a definite emotional state. We are afraid of something concrete and perhaps objective, such as death of a loved one, financial disaster, personal disgrace, physical danger. Similar body protests in the anxiety patient seem unreasonable because we see no concrete thing happening to him, and this sounds unreasonable to us. But suppose we go back and study the personality of this individual, and see if we can find a reason why he behaves in this way. In doing so we discover that he is invariably a person who all through life has been timid, supersensitive, over-anxious, an 'easy-worrier', extremely conscientious, serious-minded. One never finds anxiety states in a phlegmatic temperament. Such an anxiety temperament, prone to go out to meet trouble instead of waiting until it gets to him, is bound to react in an exaggerated way to every sling and arrow of outrageous fortune which he encounters in the pathway of life. He takes life very seriously and very hard. Circumstances which another temperament would make light of and pass over, this kind of individual broods over, takes to heart, and worries about. His family may not realize it. His friends and business associates may not know it, but the process of temperamental fermentation goes on nevertheless. For weeks and months preceding the condition that we call an anxiety attack, the soil of his conscious processes has been ploughed and harrowed for the reception of some shock or sudden experience. The shock or experience may seem trivial and insignificant to us as we look at it in the light of a single incident or episode. But to him it is the culmination of a long period of anxious worry and mental unrest. This precipitating factor may be an operation, the illness of a child, a financial loss, a demotion, a promotion to a position of responsibility, an accident. One sees the condition frequently in children following a tonsil and adenoid operation which has been preceded for weeks by family conversations about death from taking ether, and hæmorrhages, and the terrible things that happen to people in hospitals. Such talk effects an impressionable child, but rolls off a phlegmatic one.

The first point in the treatment of a patient in an anxiety state is to settle the issue of heart or stomach or thyroid condition by a thorough examination of the physiological functioning of which the patient complains. This examination should be completed as speedily as possible. Having ruled out any so-called lesional pathology the next step is to convince the patient that these body protests of heart or gastro-intestinal tract represent emotional states, the nature and content of which it is the doctor's business to discover and interpret for his patient. One must remember that all of us are very suggestible as human beings, but the anxiety neurotic is especially suggestible. It does no good to tell such a palpitating individual that his heart is sound, and then give him a tonic or some other bottle of medicine, and tell him to go slowly, to rest as much as possible, or to take a trip somewhere. The best educational process is sending such a patient right straight back to work, or to send him into crowds, or whatever else he is afraid of, telling him that he is quite likely to have other seizures, that he will feel wretchedly apprehensive, but if he will stick it out he will cure his fear, and he alone can do the trick.

The next step is to discover the factors of situation or domestic relations or vocational misfitting that have upset the patient's equilibrium. The physician who reads psycho-analytic literature is apt to go about this by looking for some very obscure and complex mental conflict. As a matter of fact the common factors lying behind anxiety states are relatively simple. It is almost useless to ask such a patient if anything is worrying him, for he usually gives a perfectly smooth story in the negative, not because he is secretive, but because he is honestly unaware of what is upsetting him. He may be aware of situations that are uncomfortable, but quite unaware that they are having any effect on

him. It is up to us to take a little time to go into such commonplace matters as fear of losing a job, illness in the family, sudden deaths from stroke and heart disease, the losing of a home through inability to meet building loan payments, an accumulation of small debts, crowded living conditions associated with having to bring indigent relatives into the family home. Having discovered these factors it is not enough to tell such a patient not to worry, and to exercise self-control. The facts revealed may make him feel ashamed that such matters could get a rise out of him. Right here it is very important to put him at ease with regard to the frequency with which similar irritations upset all of us. It is helpful to take a little time to explain to him that under situations of discomfort even you and I, his physicians, are conscious of our bodies protesting in palpitation, sweating, shortness of breath, nausea. This makes him accept his symptoms as natural biological processes that others have, and desensitizes him to scare, in a quiet, matter-of-fact manner.

Having given the patient dramatic doses of reassurance with plausible explanations, the next step is to get hold of husband or wife or parents and explain matters to them. It is well to do this in the patient's presence so that he does not think that you are telling one thing to him and another to his family. Elicit the family's intelligent co-operation in treating the next anxiety attack in as casual a manner as possible. Prescribe emphatically that the next time the patient has an attack in a movie, at home, or on the street car, the family is to sit quietly, not yielding to the patient's demands for spirits of ammonia, opening of windows, fanning, rubbing of hands and feet, and all the many procedures, environment goes through in its own fear of the patient's apprehensiveness, that he or she is dying. Such activities merely graft another scare upon the one which the patient already has. If relatives are given these instructions in the patient's presence, they have a chance to carry them out backed up by the doctor's recommendations, and the patient cannot accuse them of being cold and heartless. All these details may sound childish and a waste of time, but they are frequently necessary to produce the psychological reassurance that the patient needs to calm his panic. If the patient really wants to be well and is not using his attacks as a cudgel over the heads of the environment, and if the family will carry out their share of the treatment, the condition subsides with surprising rapidity. Of course, there are a certain number of patients who do not want to be well, and there are a certain number of patients in whom anxiety attacks are not psychoneurotic manifestations but episodes that occur as part of, or prodromal features of, a major psychosis, such as the manic-depressive and the schizophrenic or dementia præcox group, or as part of a psychopathic personality picture. Of the 232 cases mentioned above, 65 per cent responded in a matter of weeks or a month or two to the treatment procedures the writer has outlined. The remaining 35 per cent fell into the groupings of unmodified human material for reasons just described.

In summary, then, anxiety attacks, or anxiety neuroses, are common and relatively benign nervous conditions that the practitioner can handle effectively if he is not too befogged by the complexities of psycho-analytic literature, and if he is willing to take a little time and interest in understanding the personality and situational background of his respective patients. The condition, may, however, fall into chronic invalidism and a profound doctor-habit status if treated along the mechanical lines of rest, drugs, and specific intensive therapy directed against physiological systems that happen to be registering protests against emotional strains of which the patient may or may not be aware.

REFERENCES.—<sup>1</sup>*Jour. of Ment. Sci.* 1934, lxxx, July, 482, 705; <sup>2</sup>*Ibid.*, 1935, lxxxii, April, 370; <sup>3</sup>*Ibid.*, 389; <sup>4</sup>*Jour. Amer. Med. Assoc.* 1934, ciii, July 7, 13; <sup>5</sup>*Arch. Neurol. and Psychiat.* 1934, xxxii, Aug., 328; <sup>6</sup>*Mental Hygiene*, 1935, xii, Jan., 21; <sup>7</sup>*New Eng. Jour. Med.* 1934, March 22, 633.



**APIOL POLYNEURITIS.** (*See POLYNEURITIS, APIOL.*)**APPENDICITIS.***A. Rendle Short, M.D., F.R.C.S.*

**ETIOLOGY AND HISTORY.**—W. H. Bowen,<sup>1</sup> using the records of Guy's Hospital, finds confirmation of the researches published fifteen years ago by Rendle Short that the great rise in frequency of appendicitis in England took place between 1885 and 1895. There were 9 cases at Guy's in 1875, 13 in 1885, and 57 in 1895. He maintains, and justly, that the presence of a stercolith is a very important factor in bringing on a severe attack. Stercoliths are to all intents and purposes dried faeces, with much disintegrating vegetable matter as a basis. There is no foreign body. Apparently some form of appendicular stasis is the local fault.

In Australia, according to C. J. Officer Brown,<sup>2</sup> the frequency of deaths from appendicitis has been steadily rising between 1910 and 1933. In Edinburgh also there has been a steady increase in the number of cases admitted to hospital; from 737 in 1925 to 909 in 1932. The type, however, is milder, and probably more early cases are being sent in. There is no special seasonal incidence. The age most liable is 19 for both sexes. Young children and old people suffer from a much more fatal type of the disease. The general mortality in 8000 cases was 4.5 per cent; in cases with general peritonitis it was 28 per cent (L. E. Weevil and H. L. Wallace<sup>3</sup>). General peritonitis was treated by operation.

C. B. Wood<sup>4</sup> writes on appendicitis in persons past sixty, and finds the mortality 28 per cent. The symptoms are often atypical, and the diagnosis missed. Cramp-like pain, distension, constipation, and vomiting are the initial symptoms, and there may be no localization in the right iliac fossa.

**DIAGNOSIS.**—F. S. Tange<sup>5</sup> advocates a leucocyte count by the practitioner, which may give a valuable clue to the diagnosis and also to the severity of the disease. A count of 16,000 or more usually means a sharp attack. A blood sedimentation test may be helpful (A. Lesser and H. A. Goldberger,<sup>6</sup> of New York; C. T. Smith and T. Harper,<sup>7</sup> of Rocky Mount, N.C.). It takes only an hour to read. In appendicitis, whether catarrhal or suppurative, the rate is normal; in salpingitis and most other acute abdominal conditions it is increased.

**Relation of Mortality to Treatment.**—E. M. Stanton,<sup>8</sup> of New York, has reduced his death-rate from 6.9 per cent (116 cases) in 1907–15 to 5.6 per cent (380 cases) between 1915 and 1923, and 2.16 per cent (508 cases) between 1924 and 1933. The improvement is due to two factors: partly to an increased number of early cases, and, in equal degree he thinks, to better treatment of the cases seen late, with peritonitis already developed. In his earlier series he operated on a good many of these, with a high death-rate; in his later series they were all treated by the Ochsner expectant method.

E. E. Arnheim and H. Neuhof<sup>9</sup> also report a reduction from 8.2 per cent in 1928–30 to 2.8 per cent 1931–3, mild cases being excluded. The improvement is attributed to a general all-round advance in technique before and at operation, and to postponement of operation for patients with appendix abscess.

J. C. Storey<sup>10</sup> quotes a fatality-rate of 40.83 per cent in 289 cases operated on in Australia for appendicitis with diffuse peritonitis. In 85 patients so diagnosed by F. Collier and E. B. Potter,<sup>11</sup> of Ann Arbor, Michigan, the Ochsner conservative method was followed, and 9.3 per cent died. Of the 77 who survived, 29 subsided entirely without operation and in 48 a localized abscess formed and had to be opened. In the majority of these the appendix was removed at a later date. Sampson Handley<sup>12</sup> calls attention to a dangerous

type of basal appendicitis with enormous swelling of the meso-appendix due to cellulitis thereof. Rigidity of the abdominal wall is absent from the first, and a lump appears early. The appendix should be removed, but the cellulitic mass ought to be let alone unless there is an obvious collection of pus.

**Post-operative Hernia.**—G. A. Carlucci,<sup>13</sup> of New York, investigated the condition of the abdominal wall in 700 patients after appendicectomy, and found some weakness in 12 per cent. In clean cases the figure was 2·7 per cent; in drained, or infected, from 17 to 23 per cent. An actual hernia was present only in 32 of the 83 cases with an abdominal wall defect; in 33 there was merely a bulge.

**Pylephlebitis.**—According to W. H. Snyder, M. Hall, and A. W. Allen,<sup>14</sup> of Massachusetts, this dangerous complication occurred in 0·3 per cent of the total cases of appendicitis, and only 2 out of 27 sufferers survived. It was not usually diagnosed until a fortnight after the onset of the appendicitis, and was specially liable to follow not-clean cases with a succession of rigors. An early rigor is of no great importance, but about one case in six who had rigors passed on into pylephlebitis. Ligature of the ileocolic vein is recommended as a preventive, but the difficulty is to know when to do it. It is worth operating on developed cases. A few are on record in which one or more superficial abscesses of the liver were found and opened and recovery followed.

REFERENCES.—<sup>1</sup>*Ging's Hosp. Reports*, 1934, Oct., 489; <sup>2</sup>*Med. Jour. of Australia*, 1934, Sept., 407; <sup>3</sup>*Edin. Med. Jour.* 1934, Oct., 557; <sup>4</sup>*Amer. Jour. Surg.* 1934, Nov., 321; <sup>5</sup>*Med. Jour. of Australia*, 1934, Sept., 316; <sup>6</sup>*Surg. Gynecol. and Obst.* 1935, Feb., 157; <sup>7</sup>*Amer. Jour. Med. Sci.* 1935, March, 383; <sup>8</sup>*Surg. Gynecol. and Obst.* 1934, Nov., 738; <sup>9</sup>*Ibid.* Aug., 189; <sup>10</sup>*Med. Jour. of Australia*, 1935, May, 639; <sup>11</sup>*Jour. Amer. Med. Assoc.* 1934, Dec., 1753; <sup>12</sup>*Clinical Jour.* 1935, Jan., 1; <sup>13</sup>*Ann. of Surg.* 1934, Dec., 1177; <sup>14</sup>*New Eng. Jour. Med.* 1935, Jan., 183.

## APPENDICITIS, ACUTE, IN CHILDREN.

*John Fraser, Ch.M., F.R.C.S.Ed.*

**MORTALITY.**—S. McLanahan<sup>1</sup> points out that the mortality really depends upon two factors—the extent of the lesion and the age of the patient. These fundamental considerations are brought out in two groups of statistics. In a total of 179 cases the appendix was unruptured in 125, and these were submitted to operation without a single fatality; in 28 cases there was some leakage from the appendix with resulting abscess formation, and again operation was carried out without mortality; but how different was the picture in the final group of the series, cases of ruptured appendix with spreading peritonitis—here there was a mortality of 26·9 per cent.

The relation of age to death-rate is brought out in a second analysis, which may be summarized as follows. In cases of 5 years of age and under the death-rate was 22·2 per cent, between the ages of 5 and 9 years it was 1·8 per cent, while from 9 to 13 years the mortality was nil. These are impressive figures. It is true that the facts are well known and recognized, but it is surely regrettable that we do not seem able to improve the situation in any striking way. The point at issue is really one of early diagnosis, and it seems unlikely that structural peculiarities of the infantile appendix play any important part in the matter, but how earlier diagnosis is to be achieved is a very difficult problem. There are, however, three principles, which, if adopted and acted upon, would undoubtedly produce some improvement. These are: (1) To educate parents in the importance of seeking medical advice whenever a child complains of abdominal pain, meanwhile avoiding the use of cathartics; (2) To appreciate the fact that appendicitis may arise at any age; (3) To realize that early operation affords the best result.

The same question is the subject of a paper by Henry Hudson, junr.,<sup>2</sup> who makes the following statement. "In Massachusetts in 1900 appendicitis was listed as the cause of death of 25 children, while in 1930 it was the cause of death of 107. This represents an increase in child deaths from appendicitis of 428 per cent during a period in which the child population increased only 41 per cent." At first sight this seems to indicate an alarming situation, and it may be that it does so, but the conclusions to be drawn from statistics are open to misconception unless the figures are most carefully controlled, and before they can be accepted as fully reliable they demand qualification in at least two directions, an appreciation of the measure in which the diagnosis is more accurate than it was thirty years ago, and the extent to which the incidence of the disease has increased. It is true that these are points upon which it is difficult to secure reliable information, but it is evident that such information is vital if accurate conclusions are to be reached. Putting aside, however, this criticism, the paper voices the concern which the situation engenders, and makes a strong plea for the importance of educating those in charge of children in the potential dangers which underlie all cases of abdominal pain.

**DIFFERENTIAL DIAGNOSIS OF APPENDICITIS IN CHILDREN.**—In considering this question attention should be given to the possibility of *acute or subacute mesenteric lymphadenitis* simulating appendicitis. The subject is discussed by S. L. Goldberg and I. T. Nathanson<sup>3</sup> in a paper entitled "Acute Mesenteric Lymphadenitis". The syndrome produced may bear a close resemblance to that associated with acute appendicitis—there is pain referred to the lower right quadrant of the abdomen, there may be some degree of muscular rigidity, there is often nausea and even vomiting, and in some cases the temperature is raised. The glands affected are usually those in the ileocaecal angle, and the pathology of lymphadenitis depends on a variety of possibilities. The infection may arise as the result of absorption from a localized enteritis in the lower coils of the ileum; sometimes the glands are disturbed secondary to a generalized blood infection of a streptococcal or pneumococcal type; but in the majority of instances the glands are already the site of a tuberculous change, and, their resistance being thereby diminished, they react to a degree of absorption from the intestine which in a healthy subject would produce no evident change.

The decision of the exact diagnosis is often a matter of great difficulty, for it is evident that the clinical syndrome has a close resemblance to that produced by appendicitis, but, if the position is analysed with sufficient care and accuracy, it should be possible to arrive at a correct conclusion. Acute and subacute mesenteric lymphadenitis differ from appendicitis in the following ways: (1) The stage of referred middle-line pain introductory to a typical appendicitis and so characteristic of that disease is absent; (2) Although there is tenderness on pressure, there is absence of muscular rigidity, which results from irritation of the peritoneal area; (3) Vomiting is rarely present, though there may be nausea. It is true that this last feature is so inconstant as to be of little real value in the problem of differential diagnosis, but, in conjunction with other evidence, it may be of significance. The really important lesson of diagnosis, however, is that, if any doubt remains in the distinction between appendicitis and mesenteric lymphadenitis, it is infinitely wiser to operate than to risk the disaster of overlooking acute appendicitis.

F. Klages<sup>4</sup> has published a long paper on the differential diagnosis of *peritonitis* in children. The subject is discussed in such a general manner that it does not readily lend itself to review. The basis of the paper is an analysis of 550 cases observed during the past ten years, and from a statistical point of view the results have interest for those requiring information of this character.

The author claims that 64 per cent of peritonitis cases in children are attributable to infection of the appendix. The mortality figures are very similar to those reported by other observers—a general mortality-rate of 3.2 per cent, and a mortality of 28.2 per cent in general peritonitis secondary to perforation. These figures convey an additional warning as to the importance of accurate diagnosis and early operation.

In discussing the differential diagnosis between acute appendicitis and pneumococcal peritonitis Klages draws attention to the importance of the leucocyte count. He claims that in the latter disease counts have been noted of from 30,000 to 70,000 with a polymorphonuclear content of 90 per cent. This question has already been the subject of comment in the *MEDICAL ANNUAL* (1932, p. 353) when a paper by J. H. Duncan was reviewed, but recent literature on the subject has tended to raise doubt whether the leucocyte count is of real value in the diagnosis. It has been pointed out that in the early stages of pneumococcal peritonitis the leucocyte count may be relatively low.

REFERENCES.—<sup>1</sup>*Amer. Jour. Surg.* 1934, xxv, July, 14; <sup>2</sup>*New Eng. Jour. Med.* 1935, cxvii, April 11, 670; <sup>3</sup>*Amer. Jour. Surg.* 1934, xxv, July, 35; <sup>4</sup>*Zentralb. f. Chir.* 1934, Oct. 6, 2305.

**ARRHYTHMIA.** (See also HEART-BLOCK.) A. G. Gibson, M.D., F.R.C.P.

M. S. Segal<sup>1</sup> reports 2 cases of *auricular flutter* and 3 cases of *auricular fibrillation* in reviewing 192 cases of *bacterial endocarditis*. This corresponds with the rarity of these arrhythmias in this affection as originally reported. The author associates their presence with the myocardial lesions that are described in subacute endocarditis. No Aschoff bodies were found in the microscopic sections of the cases reported. The frequency of auricular fibrillation in mitral stenosis probably has to do with the stenosis itself and the consequent changes that occur in the right auricle. There was no instance in the reported series at post-mortem examination of any serious mitral stenosis, though there was evidence of mitral regurgitation.

A. C. Ernstene and B. V. Mulvey<sup>2</sup> draw attention to the occurrence of *auricular fibrillation in relation to the operation of thyroidectomy*: 7 per cent of their 213 patients had auricular fibrillation before operation, and 16 per cent of the remainder who had had normal rhythm developed it after the operation. Auricular fibrillation was present in two patients with adenomatous goitre but without hyperthyroidism before the operation, and there were four other patients also with adenomatous goitre and no hyperthyroidism who developed fibrillation after the operation. The factors that are more potent in the development of auricular fibrillation are the age of the patient and the duration of the hyperthyroidism. It is seldom seen below the age of 40. The basal metabolic rate appears to have little influence. The development of auricular fibrillation after operation appears to be more likely in those with colloid goitre with multiple adenomata. An increase in the rate of metabolism following operation is probably the essential factor in the arrhythmia.

R. D. Friedlander and S. A. Levine<sup>3</sup> made a study of 35 cases of *auricular fibrillation* and 4 cases of *auricular flutter without evidence of organic disease*: 13 of the cases of auricular fibrillation were transient and 22 were permanent. The exciting causes were exertion, gastro-intestinal disturbance, and pulmonary infections. *Digitalis* diminishes the frequency of transient attacks of fibrillation but is ineffective in restoring normal rhythm in the permanent group. *Quinidine*, however, is generally effective. The authors emphasize from this study the view that auricular fibrillation and flutter must be regarded in some cases as benign or functional, and they suggest a neurogenic origin in these instances.

M. Campbell and S. S. Suzman<sup>4</sup> report a case of *auricular flutter which showed*

*temporary reversion to normal rhythm* after six years. She was a middle-aged woman who had had rheumatism and had suffered in 1927 from aortic and mitral disease and severe congestive failure. At that time she was found to have auricular flutter with a 2-1 heart-block. After six years of flutter, while on digitalis three times a day which she had been taking for some time, normal rhythm returned and continued for three months. The advent of normal rhythm improved her condition, though throughout she suffered from slight cedema.

F. Josephthal<sup>5</sup> records a case of cardiac collapse nineteen days after the commencement of diphtheria and two days after discharge from hospital. The patient appeared moribund, electrocardiograms showed a frequency of 250, and the auricular complexes were unrecognizable. The diagnosis of *ventricular fibrillation* was made and the patient was restored by giving intravenous injections of 20 c.c. of 25 per cent *dextrose* solution. Three months later the electrocardiogram was practically normal.

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# ARTERIES, PERIPHERAL, DISEASE OF. (See also BLOOD-VESSELS, SURGERY OF; HYPERTENSION.)

A. G. Gibson, M.D., F.R.C.P.

In regard to the *pain in thrombo-angiitis obliterans* G. A. Goldsmith and G. E. Brown<sup>1</sup> find several distinct types: that arising from blood-vessels, from spasm or stretching, infection, that induced by exercise, pain occurring at rest, the pain of ulcers and gangrene, the pain of inflammatory lesions of blood-vessels, and the pain of acute occlusion and ischaemic neuritis. The two main factors are ischaemia and inflammation. All types of pain are amenable to treatment with the exception of that caused by severe degrees of ischaemic neuritis.

N. W. Barker<sup>2</sup> points out the extreme danger of such injuries as minor bruises, irritation from the rubbing of shoes, exposure to cold, and even the normal pressure such as on the soles of the feet, in conditions of *threatened gangrene*. Of 171 patients with thrombo-angiitis obliterans, in 10 per cent gangrene had followed accidental trauma of this kind, and in 35 per cent it had followed therapeutic measures undertaken for painful toes or feet. In a corresponding series of 115 patients with arteriosclerosis in which the circulation had become deficient accidental trauma preceded gangrene in 17 per cent and therapeutic procedures in 39 per cent. The therapeutic procedures included the removal of ingrowing toe-nails and of corns, incisions for suspected abscesses, thermal burns, and the application of strong chemicals for skin conditions. The author suggests that in all these procedures it ought to be ensured that the circulation in the main arteries is adequate.

G. de Takáts<sup>3</sup> confirms the value of the *treatment of organic vascular obstruction by intermittent negative pressure*. Rest pain was promptly abolished at the beginning of treatment. Intermittent claudication was improved in those with sufficient cardiac reserve after prolonged treatment. Cyanosis, particularly that from frost-bites, was improved. Indolent ulcers healed more promptly. No effect was seen in gangrene. The least favourable outlook is in those with arteriosclerosis, cardiac damage, and a moderate or low blood-pressure. In two patients with Buerger's disease (thrombo-angiitis obliterans) there was no response.

E. M. Landis and L. M. Hitzrot<sup>4</sup> find that this method has considerable value in the treatment of advanced peripheral vascular disease. Cyanosis was usually diminished and the symptoms improved. The rest pain of ischaemia

was abolished during the use of suction and pressure, and became less severe in the intervals, but lasting relief of pain was not seen when gangrene or large sloughs were present. Enlarging or indolent ulcers began to heal soon after beginning the therapy, and the pain of intermittent claudication became less. The application of this method must be cautious and small changes of pressure used at first. It is contra-indicated in the presence of acute inflammation or encapsulated pus. The pressures used were from - 80 to - 120 mm. of mercury up to 40 to 80 mm. of mercury, negative pressure being applied for 25 seconds and positive for 5 seconds. Treatment was from one to two hours once or twice daily to three times weekly, and finally reduced to once weekly.

L. G. Herrmann and M. R. Reid<sup>5</sup> also give their experiences in the conservative treatment of peripheral vascular disease, especially by this method. There are illustrations of the method and of the instruments necessary. They conclude that methods directed towards the increasing of the circulation have a very important place in the treatment of these conditions. In the course of over 12,000 treatments they have obtained startling results amongst patients suffering from more or less sudden occlusion of one of the major arteries of an extremity such as for instance from ligation or embolism. The danger of gangrene can often be averted. In this type, of 75 patients, after varying amounts of treatment, all patients reported complete relief of all major symptoms, including severe intermittent claudication, and no amputations were necessary. When the secondary arterial pathways of the extremity were affected, out of 46 patients 20 were completely relieved of all major symptoms, and 23 were greatly improved and able to resume their work, but were not completely relieved of pain. In those with involvement of the arterioles of the feet, 3 only out of 19 stated that they had been relieved of their pain and that the colour of their feet had improved.

E. L. Stern<sup>6</sup> finds that the *intraspinal subarachnoid injection of absolute alcohol* can be used from time to time without harm as a method of relieving pain and improving the circulation in the early stages of thrombo-angiitis obliterans. It appears to affect the dorsal roots only and in so doing blocks certain afferent nerves for a long period without paralysing any muscle. It relieves the pain of intermittent claudication and of ulcers or of amputation stumps by improving the circulation. The method is to inject 8 to 16 min. of absolute alcohol at intervals of about one week until all the dorsal roots to the tenth thoracic nerve downwards are affected on both sides. In the case of the lower limbs the first injection is given between the 8th and 9th thoracic spines, the next injection one space lower after a week's interval, and so on, until all the posterior roots of the lumbar and sacral segments have been exposed to alcohol. It is necessary to use great care when injecting between the 2nd and 3rd lumbar spines, and to give only small doses, as serious bladder and rectal paralysis may result.

G. W. Scupham<sup>7</sup> finds that *theobromine and its salts*, or theobromine sodium acetate, act best as peripheral dilators in peripheral arterial sclerosis and thrombo-angiitis obliterans. They are particularly useful when a spasmodic element is prominent. Subjective symptoms are important, and some tendency to repair the loss of tissue integrity has been noted. Their action fails in certain cases. In Raynaud's disease and acrocyanosis, which are included in the functional group, no improvement could be shown even in one case treated for six weeks. The results were experimentally confirmed by observation of the skin temperature.

REFERENCES.—<sup>1</sup>*Amer. Jour. Med. Sci.* 1935, clxxxix, 819; <sup>2</sup>*Jour. Amer. Med. Assoc.* 1935, civ, 2147; <sup>3</sup>*Ibid.* 1934, ciii, 1920; <sup>4</sup>*Amer. Jour. Med. Sci.* 1935, clxxxix, 305; <sup>5</sup>*Ann. of Surg.* 1934, c, 750; <sup>6</sup>*Med. Record*, 1935, cxli, 244; <sup>7</sup>*Arch. of Internal Med.* 1934, liv, 685.

**ARTERIOSCLEROSIS.** (See BLOOD-VESSELS, SURGERY OF.)

**ASBESTOSIS.** (See INDUSTRIAL DISEASES.)

**ASTHMA AND HAY FEVER.** (See also BRONCHITIS AND EMPHYSEMA.)

L. S. T. Burrell, M.D., F.R.C.P.

**Asthma.**—Opening a discussion on the etiology and treatment of asthma, Sir Humphry Rolleston<sup>1</sup> said that it was only one of the reactions in the large group of allergic diseases. *Adrenalin*, which gives so much relief in asthma, is said to remove eosinophils from the blood. Livingstone<sup>2</sup> referred to treatment by *breathing exercises*, which has three objects: (1) To get rid of the temporary emphysema; (2) To increase the diaphragmatic, and so reduce the thoracic, breathing; (3) To relax the intercostal and other respiratory muscles which are in a state of spasm. He said that out of 77 cases, 66 per cent showed considerable, and another 16 per cent slight, improvement. Adams<sup>3</sup> stressed the importance of nutrition and intestinal toxæmia. He said that the belief that asthma resulted from a toxicosis would explain the hypochlorhydria, impaired liver, renal, and thyroid function, and the cachexia. There is no doubt that *intestinal antiseptics*, such as hydrarg. c. cret. or calomel, or a course of *colonic irrigation*, often give great relief.

Levin<sup>4</sup> advocates the *injection of 2.5 c.c. of absolute alcohol* into the third, fourth, fifth, or sixth intercostal space, 4 cm. away from the spine, in order to paralyse the bronchial rami in the sympathetic dorsal fibres where they join the intercostal nerve. Of 16 patients treated in this way there was complete relief in 10 after from four to eight injections, and in only 2 cases was there only slight improvement, although the majority were of long standing.

Asthma may be a reflex action, especially from the nose. Irritation in the nose often produces rhinorrhœa or hay fever, and although asthma cannot be caused by stimulation of the nose, Moll<sup>5</sup> says that certain areas in the nose, and especially the middle turbinate, are closely associated with the nasopharyngeal reflex, and irritation may cause bronchospasm. He thinks, however, that hypertrophy of the turbinates and sinus disease are more often the result than the cause of asthma. He reports the result of operation on the nose or throat in 109 patients, and only 3 of them were cured. The operation was tonsillectomy in 43, of whom 1 was cured, 5 much improved, and 24 remained unchanged. In the other 2 cases of cure the operation was for removal of a polyp in one and a tonsillectomy with submucous resection in the other. He states that of a series of over 700 cases treated by operation and reported in the literature, 10 per cent are reported as cured and 56 per cent as improved. The result of operation must be regarded as disappointing.

Freeman<sup>6</sup> considers there are at least five factors which determine the site or localization of an allergic reaction: (1) The place of action of the irritant; thus, if the nose is irritated rhinorrhœa occurs, whereas urticaria follows irritation of the skin after an insect sting. (2) Trauma; after pneumonia or poison gas the lungs may be injured, and tendency to asthma develop. (4) Nerve irritation. (5) Psychological factor; this factor undoubtedly exists, though Freeman thinks it is exaggerated by some psychologists.

Livingstone<sup>7</sup> agrees that there is a neurotic type in which the attacks are associated with emotion or worry. It seems probable, however, that there is always some other element besides the neurotic one. At the beginning of an attack an *emetic* is most valuable. The immediate relief which often follows vomiting suggests that it is due to a reflex rather than toxic elimination, although it is advisable to give calomel and salts in order to disinfect and clear the bowels.

Each asthmatic has his own remedy, and what suits one fails with another. *Adrenalin*, or some allied preparation, gives relief in the actual attack in most cases, so that if it fails one may suspect that the case is not one of simple asthma. The reviewer recently saw a patient with severe asthma which did not yield to any treatment, and proved fatal in four months from the onset. The autopsy showed a membranous bronchitis.

Treatment by *inhalation* is sometimes useful, and the Apneu apparatus<sup>8</sup> is a good one to use, as it is worked by oxygen, and under sufficient pressure to make very small the particles of the drug used.

Skin tests are not now employed so frequently in order to discover hypersensitiveness. It is recognized that a positive skin reaction may be produced by a substance which does not cause asthma in the individual tested, whereas a causative substance may fail to give a positive skin reaction. Colmes<sup>9</sup> made skin tests in 250 asthmatics, 93 with urticaria, and 314 with seasonal hay fever. He found that of the asthmatics only 40 per cent of the reactions were of clinical and diagnostic importance and in urticaria only 4 per cent. In hay fever, however, 99 per cent reacted to pollens which were causative of their disease.

**Hay Fever.**—Freund<sup>10</sup> has obtained good results by *specific protein desensitization* before and during the season, but better still by giving the injections all the year round. He found that when the injections are stopped tolerance rapidly disappears, as can be shown by skin tests. If injections are given every fortnight all the year round, tolerance is maintained.

Walker<sup>11</sup> states that of 100 patients cured apparently by desensitization, in 44 the skin tests remained positive. He also found many cases of positive skin reactions in patients who had never shown any manifestations of allergy.

REFERENCES.—<sup>1</sup>*Proc. Roy. Soc. Med.* 1935, xxviii, 247; <sup>2</sup>*Ibid.*, 252; <sup>3</sup>*Ibid.*, 255; <sup>4</sup>*Lancet*, 1934, ii, 249; <sup>5</sup>*Brit. Med. Jour.* 1934, ii, 299; <sup>6</sup>*Proc. Roy. Soc. Med.* 1935, xxviii, 248; <sup>7</sup>*Practitioner*, 1935, cxxxiv, 591; <sup>8</sup>*Inhalation Therapy Technique*, 1935, London: Heinemann; <sup>9</sup>*New Eng. Jour. Med.* 1935, ccxii, 725; <sup>10</sup>*Med. Record*, 1935, cxli, 357; <sup>11</sup>*Jour. Amer. Med. Assoc.* 1926, xc, 750.

## BANTI'S DISEASE. (See BLOOD DISEASES.)

## BED-BUGS AND THEIR CONTROL.

G. E. Oates, M.D., M.R.C.P., D.P.H.

The most prevalent and the most troublesome of the insects which infest working-class houses is the bed-bug. Once introduced into an old and dilapidated house it is almost impossible to eradicate this pest by household remedies. The capacity of the bed-bug to travel considerable distances is often responsible for house-to-house infestation, but more commonly the insects are introduced on the clothing or in furniture. Like all insects, bed-bugs can be killed by insecticidal powders and sprays, but it may be impossible to reach them behind plaster and skirting-boards. A gas is more effective, and a safe and reliable one is *sulphur dioxide*, transported in the liquefied form or, more cheaply, generated by the burning of rock sulphur. Unfortunately this gas is not invariably lethal to the eggs and immature stages of the bed-bug, and repeated sulphur fumigations may be necessary if eradication is required. *Hydrocyanic acid gas* is intensely lethal to bed-bugs and affords the only reliable method of eradication after one exposure. The gas can be generated in pots by adding sodium cyanide to sulphuric acid and water, or by the use of the liquefied gas in the form of a spray. Other methods include the use of liquid cyanide absorbed in kieselguhr (Zyklon B) or in discoids of wood pulp, both of which give off the gas when exposed to the atmosphere. Whatever method is used,



it is essential that a concentration is maintained that will kill bed-bugs and their eggs—for instance, a concentration of 2 per cent for two hours is stated to be absolutely effective.

Hydrocyanic acid is coming into general use for the disinfection of furniture, of houses prior to occupation, and of houses prior to demolition. A. M. M. Grierson<sup>1</sup> describes the methods used in the City of Manchester, where over a thousand houses and their contents have been dealt with. An important feature is the disinfection of the furniture, bedding, and clothing of families from slum-clearance areas who are moving to corporation houses. Bedding and clothing admit of steam disinfection, but the furniture is placed in a specially constructed van into which the hydrocyanic acid is introduced. After an exposure of three hours or more the van is opened up and the contents thoroughly aired in order to remove the poisonous gas. Its presence is detected by exposing strips of filter paper moistened with copper benzydine acetate, which turn blue. Any bedding or soft goods which might retain gas are removed to the open air, where they are beaten before being placed in a hot-air chamber, which is maintained at a temperature of 145° and ensures the removal of any traces of gas.

Houses which are verminous and about to be demolished are fumigated in order that bed-bugs and their eggs may not be dispersed and possibly taken into other houses attached to wood and plaster. The house is rendered gas-tight by sealing up from the outside all openings except the front door. Chimney pots are removed and slates are mortared over chimney openings, waste and overflow pipes are sealed, and openings to cellars are made up by slates mortared to the pavement, and finally the windows and doors are sealed with paper and paste. The house is roped off, to prevent access by the general public, warning notices are posted, and a close watch is kept. The material to generate the gas is introduced by a trained fumigator wearing a gas-mask, and when he emerges from the front door it is rapidly sealed. After six hours the house is opened up by the fumigator, and when the atmosphere of the house has been found to be free from the gas a certificate is signed and delivered to the officer of the authority. It is also becoming the practice to disinfect occupied corporation houses with hydrocyanic acid at the request of the tenant. Here it is important that the operation should not last longer than four hours. The longer the gassing period, the greater is the absorption, thus increasing the difficulty of freeing furniture and other articles from the gas. Where the house is semi-detached or in a terrace it is better to deal with the houses all together. After fumigation of a sound corporation house it is possible for the tenants to return to it the same evening, but a special difficulty is presented by old occupied houses exhibiting dampness of walls, floors, and ceilings. Owing to the fact that the gas is retained for a considerable time in wet material, such houses have to be vacated for several days and the procedure is rarely practicable. (*See also* POISONING—HYDROCYANIC ACID GAS.)

It must be emphasized that the bed-bug is not only a house parasite, but, as its name indicates, it is found in furniture. It is also a personal parasite in so far as it can obtain its food from no other source than human blood. All the above drastic methods will be effective and permanent in their results only when supplemented by persistent efforts to keep houses free from vermin. This attitude exists generally amongst the better classes. Amongst the working classes there is still much indifference, and so long as this is the case the bed-bug will continue to be a menace to comfort and an offence to decency.

REFERENCE.—<sup>1</sup>*Public Health*, 1935, xlviii, No. 10, July, 347.

**BED-SORES.** (*See* WOUNDS AND WOUND INFECTIONS.)

**BELL'S PALSY.** (*See* FACIAL PARALYSIS.)**BERI-BERI.***Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

**ETIOLOGY.**—The chemical composition of Bengal rice is dealt with by K. P. Basu and S. N. Sarkar,<sup>1</sup> who point out that no such previous analyses of any of the 540 different varieties described in that province have been made. They found that the husked rice is richer in protein, fat, carbohydrate, and phosphoric acid than the original paddies, and that polishing to form white rice decreases the fat, fibre, ash, phosphoric acid, and potash content. 'Parboiling' has little effect on the chemical constitution except for slight loss of moisture. The bran, or rejected residue after polishing rice, is richer in protein, fat, and phosphoric acid. The Bengal rice differs little from other Indian rice except in being slightly deficient in fat and protein. In a further paper<sup>2</sup> the same workers discuss the action of taka diastase on the digestibility of Bengal rice, and conclude that parboiled rice is more digestible than the sun-dried form, and this they attribute to the process of parboiling dextrinizing the contents to some extent.

A form of general oedema with malnutrition common in Rangoon in rice-eaters is described by M. L. Kundu.<sup>3</sup> The condition belongs apparently to the deficiency group, and is characterized by progressive general oedema and moderate anæmia, and he thinks it may be similar to famine dropsy in unemployed labouring classes who can only afford cheap white rice and leafy vegetables very poor in fat and vitamins. The urine and circulatory organs are normal, nerve symptoms are absent, and rapid improvement follows the addition to the diet of milk, eggs, red rice, or good bread. Deficient diet as a cause of beri-beri is also discussed by D. D. Chatterjee<sup>4</sup> on the basis of experimental feeding of rats and pigeons on a vitamin B deficient diet composed of casein, starch, olive oil, salts, and agar-agar, to which in one half of the rats 50 grm. of marmite was added. Various physiological data were recorded, and the conclusion is arrived at that starvation is a potent cause of the wasting, and that the absence of vitamin B results in loss of appetite, preventing the animals consuming sufficient of the food provided them, and this is secondary to a duodenitis and changes in the capacity to smell, to which is sometimes added bacterial infection.

**REFERENCES.**—<sup>1</sup>*Ind. Jour. Med. Research*, 1935, xxii, April, 745; <sup>2</sup>*Ibid.* 765; <sup>3</sup>*Ind. Med. Gaz.* 1935, xxxviii, March, 60; <sup>4</sup>*Jour. Ind. Med. Assoc.*, 1935, iv, April, 309.

**BILHARZIASIS.** (*See* SCHISTOSOMIASIS.)**BLACKWATER FEVER.** (*See* MALARIA.)**BLADDER, SURGERY OF.***Hamilton Bailey, F.R.C.S.*

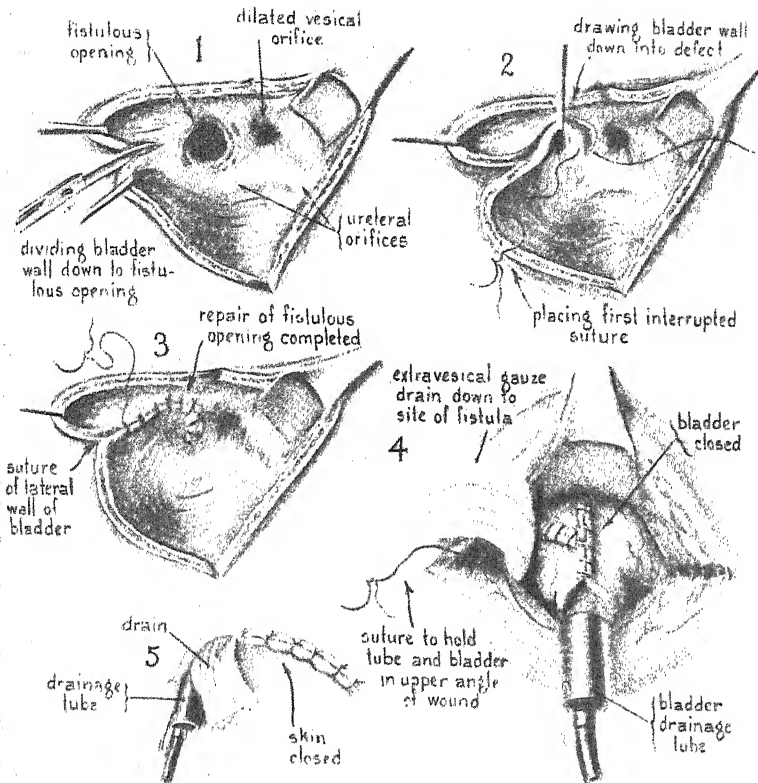
**The Sign of the Hand in Vesical Calculus in Childhood.**—Small boys with vesical calculus often present characteristic appearances of the left hand. The skin of the palm is thickened and macerated and has an ammoniacal odour. Brun<sup>1</sup> found the sign of the hand present in 70 per cent of boys operated upon by him for vesical calculus. The condition is brought about by gripping the penis during the spasms of pain which are accompanied by incontinence.

**Vesico-vaginal Fistula.**—This is often an extremely difficult condition to treat. Recurrence occurs only too often. The first successful technique was devised by Marion Sims in 1852, and his procedure, with very slight modifications, is applicable at the present time. The operation is conducted through a suprapubic bladder incision and the steps are seen clearly in *Plate IV*. T. J. Kirwin and O. S. Lowsley<sup>2</sup> are inclined to think that the silver wire sutures

# PLATE IV

## VESICO-VAGINAL FISTULA

(T. J. KIRWIN and O. S. LOWSLEY)



Repair of a vesico-vaginal fistula by the trans-vesical route.

*By kind permission of the 'Journal of Urology'*



used by Sims eighty years ago are still the best. The success of the operation depends on excising the devitalized tissues about the edge of the fistula very thoroughly. Suction drainage through the suprapubic de Pezzer catheter helps very considerably in aiding union of the sutured tissues. Of 60 cases of vesicovaginal fistula treated at the New York Hospital, 37 followed difficult labour, and 16 pelvic operations.

**Obscure Pseudo-membranous Trigonitis (*Trigonitis Acreta Alba*).—**Few urological problems are more baffling than a determination of the cause of frequency of urination, especially in the female whose urine is normal in every way. P. S. Pelouze<sup>3</sup> considers that a number of these cases are due to pseudo-membranous trigonitis. In order to determine the presence of these lesions it is necessary to look at the trigone through the cystoscope diagonally. In appearance the lesion looks as though the surface had been touched with a weak solution of silver nitrate. All but a comparatively small number of these patients are rendered symptom-free by the local use of dilute solutions of silver nitrate. Half an ounce of 1 per cent solution is instilled into the empty bladder and allowed to remain until the next urination. Two or three days later a 2 per cent solution should be used. In stubborn cases a 5 per cent solution of silver nitrate solution applied to the lesion by means of a bevel-ended ureteral catheter when the bladder is full is often efficacious. (See also URETHRA, SURGERY OF—GRANULAR URETHRITIS IN WOMEN.)

Another cause of obscure urinary frequency, says E. J. Manwell,<sup>4</sup> is that associated with infestation by the *Trichomonas vaginalis*. These cases are accompanied by profuse irritating vaginal discharge in which *Trichomonas vaginalis* is found. Again, much relief follows bladder irrigations with silver nitrate. Of 33 women who harboured the organism, 22 were found to have definite urinary symptoms. Occasionally the *Trichomonas vaginalis* infects the lower male urinary tract. Of 32,000 specimens of prostatic fluid examined, this organism was found in 16.

**Post-operative Retention of Urine.**—N. R. Barrett<sup>5</sup> found that in a series of 414 patients operated upon for general surgical conditions, post-operative retention occurred in 9 per cent of males and 7 per cent of females. In a group of patients in whom a catheter was passed as soon as the complaint was made, two-thirds required no further treatment and the remainder were relieved by the administration of hexamine. This author recommends that an instrument should be used when the patient first complains of difficulty.

**Vesical Tuberculosis.**—Direct internal radiation of ultra-violet light to the bladder has given encouraging results. The applicator used by S. L. Wang<sup>6</sup> is shown in Fig. 5. When the instrument has been inserted the bladder is emptied of urine and insufflated with air before irradiation. The treatments are given, usually, once a week, and vary from five to twenty seconds, depending on local reactions.

**Cystography in the Diagnosis of Vesical Diverticulum.**—Diverticula of the bladder are associated with median-bar obstruction more often than with prostatic hypertrophy. R. B. Herbst<sup>7</sup> has found that cystography is the best method of investigating these cases. A 3 per cent solution of sodium iodide is the best medium for cystography; it is inexpensive, non-irritating, and of sufficient density. O. S. Lowsley<sup>8</sup> finds that lateral pictures are very helpful in order to gauge the size of a diverticulum.

**The Treatment of Malignant Tumours of the Bladder.**—A. Hyman<sup>9</sup> divides the methods of treating malignant disease of the bladder into three classes.

**Method One.**—This is suitable for fairly early cases. Suprapubic cystostomy is performed and the tumour is removed with a diathermy electrode. Into

the base of the tumour are implanted non-removable seeds of radon of a strength of  $2\frac{1}{2}$  mc. At least twelve radon introducers should be available. The number of radon seeds used will depend on the size of the growth. The first row is implanted in the extreme margin of the tumour in order to destroy potentially malignant cells beyond the growth. In large tumours as many as thirty or forty seeds have been inserted, delivering a dosage of 4000 to 6000 mc. hours. The edges of the bladder are seared lightly with the diathermy, and before closing the bladder, the bladder and the wound are flooded with 50 per cent alcohol which destroys any broken-off tumour cells. All the instruments used up to this time are discarded for a fresh set. The bladder is then closed, leaving a medium-sized de Pezzer catheter in the lower end of the wound.

*Method Two.*—In more extensive cases in such a position as to make resection feasible, Hyman advocates partial cystectomy.

*Method Three.*—In recurrent cases, and cases unsuitable for partial cystectomy, total cystectomy is advocated.

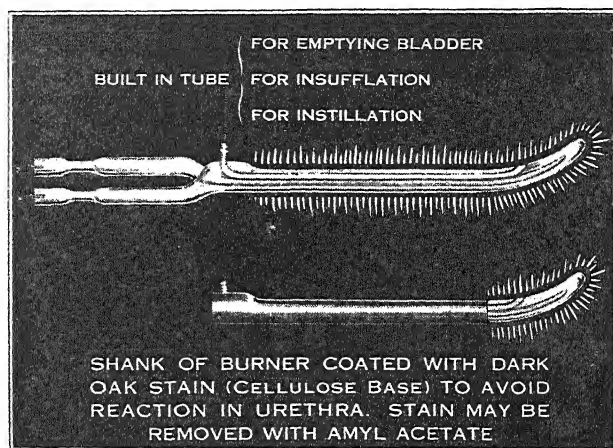


Fig. 5.—Wang's method of application of ultra-violet rays to the tuberculous bladder.  
(By kind permission of the 'Journal of the American Medical Association'.)

*Total Cystectomy.*—There are several articles dealing with the operation of total cystectomy, which is being used more widely. Hyman has removed the whole bladder in 19 cases, with an operative mortality of 21 per cent, some of the patients being alive for periods from five to nine years. This author recommends cutaneous ureterostomy as the most practical method of diverting the urinary stream in these cases.

The tendency is for carcinoma of the bladder to be situated in the lower segment of the organ, which renders partial cystectomy impracticable. The operative removal of the urinary bladder in its entirety carries with it the perplexities of diversion of the urine, and it is W. C. Quinby's<sup>10</sup> opinion that this problem has led the surgeon to choose methods of treatment which are acknowledged to be less thorough than they should be. Removal of the bladder is not a very formidable operative procedure. Quinby says, "From my experience of these patients, especially when comparing them with patients whose bladder carcinomata have been treated by radium and partial excision,



not be long. By dissecting under the pubic arch the apex of the prostate is localized. Following the capsular surface of the prostate, the membranous urethra is freed so that it can be encircled by the finger; it is then divided between clamps. The prostate is peeled from the rectum and the fascia covering the vesicles is incised. Each vas and the accompanying vessels are isolated and clamped (*Fig. 6*), as also is each vascular pedicle with the ureter. The bladder is now attached only to the peritoneum and the urachus, and the remainder of the operation presents no special difficulties. Drainage of the pelvic space is essential.

**Metastasis in Neoplasms of the Bladder.**—It is agreed generally that malignant tumours of the bladder tend to remain confined to the bladder cavity. There are comparatively few reliable statistics as to the frequency and site of metastatic deposits in these cases. A. D. Spooner's<sup>13</sup> report of the findings at post-mortem in 163 cases of carcinoma of the bladder occurring at the Mayo Clinic is very instructive. Metastases were present in 29 per cent, the commonest site of malignant extension being in the regional lymph nodes. The liver was involved in 14 cases, and the lung in 9 cases. Skeletal involvement appeared to be comparatively uncommon.

**Perineal Drainage of the Perivesical Space.**—Professor G. Illyes,<sup>14</sup> of Budapest, uses perineal drainage of the pelvic space after such operations as partial or complete cystectomy, excision of a diverticulum of the bladder, or transplantation of a ureter. He gives the following directions: "We feel for the lowest part of the symphysis and perforate the pelvic fascia with a slightly curved blunt hæmostat one and a quarter inches from the middle line near the lower edge of the os pubis. The beak of the instrument appears in the perineum and an incision is made on to it, after which the drainage tube is drawn to the pelvic cavity. Perineal drainage, being dependent, is ideal in these cases."

**Dysfunction of the Bladder following Excision of the Rectum.**—Bladder function is very liable to be interfered with for a time after excision of the rectum. J. B. Macalpine<sup>15</sup> has on several occasions been pressed to remove the prostate to rectify this trouble. In each instance, however, micturition has been re-established after an interval of waiting.

REFERENCES.—<sup>1</sup>*Monde méd.* 1934, xlv, 886; <sup>2</sup>*Jour. of Urol.* 1935, xxxiii, 51; <sup>3</sup>*Ann. of Surg.* 1935, ci, 594; <sup>4</sup>*New Eng. Jour. Med.* 1934, cexi, 567; <sup>5</sup>*Lancet*, 1934, ii, 1046; <sup>6</sup>*Jour. Amer. Med. Assoc.* 1935, civ, 720; <sup>7</sup>*Ibid.* 1934, cii, 188; <sup>8</sup>*Ibid.* 192; <sup>9</sup>*Amer. Jour. Surg.* 1935, xxviii, 5; <sup>10</sup>*New Eng. Jour. Med.* 1935, ccxii, 460; <sup>11</sup>*Jour. of Urol.* 1935, xxxiii, 179; <sup>12</sup>*Surg. Gynecol. and Obst.* 1935, lx, 685; <sup>13</sup>*Trans. Amer. Assoc. of Gen.-Urin. Surgeons*, 1934, xxvii, 81; <sup>14</sup>*Brit. Jour. Urol.* 1935, viii; <sup>15</sup>*Proc. Roy. Soc. Med.* (Urol. Sect.), 1934, xxxviii, 39.

## BLOOD DISEASES. (See also ANÆMIA, PERNICIOUS.)

Stanley Davidson, M.D., F.R.C.P.E.

### ACHRESTHIC ANÆMIA.

J. F. Wilkinson and M. C. G. Israels<sup>1</sup> describe seven cases of hyperchromic megalocytic anæmia, which closely resembled pernicious anæmia except for two important differences: (1) The presence of free hydrochloric acid in the stomach; and (2) Their failure, complete or partial, to respond to active liver preparations. An extract of the liver, made from one of these patients who died, was found to be active when injected into another case of pernicious anæmia. Accordingly the authors suggest that the ability to produce the active anti-anæmic principle and store it in the liver was unimpaired. For some reason which they are unable to explain they believe that the anæmia may be due to an inability to utilize, or possibly mobilize, the storage depots



in the liver and kidney of the anti-anæmic principle, and thus the bone-marrow remains in a megaloblastic condition. For this reason they term this group of rare anæmias 'achresthic anæmias' from the Greek word *χρησθαί* (to utilize). Only one case, so far, has come to autopsy. Before achresthic anæmia can be accepted as a disease entity, further information will be required regarding the state of the bone-marrow. At present the possibility that some of these cases may be examples of chronic aplastic anæmia cannot be excluded.

#### HODGKIN'S DISEASE.

An excellent account of the clinical aspects of Hodgkin's disease is given by W. W. D. Thomson,<sup>2</sup> of Belfast. From the same school an interesting investigation into certain biological aspects of the disease is reported by W. B. Davis.<sup>3</sup> It will be remembered that M. H. Gordon discovered that an encephalitis develops in rabbits when a filtered broth suspension of lymphadenomatous tissue is injected into the brain. U. Friedemann, however, claims that a similar effect can be produced by the injection of a chemical extract of normal bone-marrow. If the latter contention is correct, the encephalitogenic agent would appear to be not a living virus but a proteolytic ferment of a type similar to that found in human leucocytes by Joehmann. W. B. Davis accordingly has applied both the Gordon and the Friedemann technique to lymphadenomatous tissue, and compared the results of these tests from a diagnostic standpoint. He found that a higher percentage of positive results was produced by Friedemann's method than by Gordon's. In the control cases of other diseases of the lymphatic system negative results were obtained by both methods. He believes, therefore, that the Friedemann technique may with advantage replace Gordon's method. Friedemann's method of extraction is more complicated than that of Gordon's, but the elimination of strict asepsis, so essential in the preparation of a broth suspension, is adequately compensated for by the additional manipulation involved. If Davis's claims are substantiated, it may be said that another important advance has been made in the diagnosis of Hodgkin's disease.

**ETIOLOGY.**—For many years strong belief has been held that there is some close relationship between Hodgkin's disease and tuberculosis. More recently certain claims have been made that the avian strains of *B. tuberculosis* are responsible. Evidence against this view was submitted in last year's MEDICAL ANNUAL (p. 44). P. E. Steiner<sup>4</sup> has carried out a series of tests to investigate the relationship of tuberculosis to Hodgkin's disease. Tuberculin proteins prepared from both avian and human strains were used in performing intracutaneous tests in 35 patients with Hodgkin's disease, with a view to obtaining information on the possible etiological rôle of the avian tubercle bacillus. No evidence of specific sensitization to either form of tuberculin protein was obtained—in fact a marked desensitization was present. This absence of normal adult sensitization was held to be of diagnostic value, especially in the differential diagnosis of tuberculous adenitis. The author interprets his findings as follows: (1) The process of Hodgkin's disease desensitizes its victims to tuberculin proteins; or (2) Hodgkin's disease usually occurs in persons in whom the development of the normal sensitization to tuberculin protein is impossible. In either case, he suggests that it is difficult to conceive of these phenomena as occurring in a disease absolutely unrelated to tuberculosis.

**TREATMENT.**—All modern workers are agreed that Hodgkin's disease is incurable, but that treatment by *irradiation* produces a marked improvement in the clinical symptoms and a prolongation of life. The survival

period following irradiation has received particular attention from two different workers in America. L. F. Craver<sup>5</sup> has investigated 310 cases, 125 of which were proved by biopsy; 10 per cent showed a survival following irradiation of five years or over. Favourable features were localization of the disease in one area, combined with early and thorough treatment; absence of leucocytosis or leucopenia; and gain in weight after irradiation. Fever and marked splenomegaly were unfavourable signs. T. Leucutia<sup>6</sup> made a large-scale analysis of cases of lymphosarcoma, Hodgkin's disease, and leukaemia, which had been submitted to irradiation: 2425 cases were collected from the literature, of which 129 were personally observed. The author reports the following conclusions: (1) In lymphosarcoma the five years' survival amounts to 30 per cent, and the ten years' survival to at least 10 per cent; in the remainder the expectation of life is increased by two and a half to three and a half years. Immediate results often are so prompt and decisive that they may be called 'spectacular'. (2) In Hodgkin's disease a five years' survival is obtained in 15 to 33 per cent, but the cases remain carriers of the disease, necessitating frequent resumption of the irradiation. A ten years' survival or cure occurs in 8 per cent of the cases or less. The average expectation of life is increased at least two to two and a half years. Symptomatic improvements are nearly always marked. (3) No cure is believed to occur in leukaemia as a result of irradiation. The prolongation of life is rather insignificant, perhaps one-third to a quarter of the natural expectancy, which is considered to be about three and a half years in the chronic forms of both types. The symptomatic improvement, however, is remarkable, and the efficiency of the patient is increased by at least 60 per cent throughout the major part of the duration of the disease.

#### LEUKAEMIA.

A most excellent article on the differential diagnosis of the leukaemic state is reported in a paper by R. R. Kracke and H. Garver.<sup>7</sup> The most reliable criterion for diagnosis of any leukaemia, the authors claim, is a preponderance of immature cells, regardless of the total number. They have examined the case reports of a large number of cases of monocytic leukaemia which are filed in the hæmatological register and have come to the conclusion that the chief cell type in monocytic leukaemia originates in the bone-marrow, since undoubted cases of monocytic leukaemia have terminated in myeloblastic leukaemias. Monocytic leukaemia is accordingly held to be only an atypical phase of myelogenous leukaemia.

TREATMENT.—N. Rosenthal and W. Harris,<sup>8</sup> workers who have had large experience of leukaemia in New York, give an excellent survey of the methods of treatment. The aim of treatment should be to reduce the number of white cells and to increase the hæmoglobin and red blood-cell count. Although this may not necessarily prolong life it will usually increase efficiency and well-being. Several methods are available for the reduction in number of white blood-cells, and these are discussed under the headings of chemical, biological, and physical. The authors, however, have little doubt that physiotherapy—namely, *radiotherapy*—is by far the most satisfactory form of treatment. They say that no definite plan of treatment should be outlined in advance for any individual case, as the marked radio-sensitivity of leukaemic tissues and the lability of the blood-count necessitate extreme caution. In general, a marked reaction should be avoided, and rapid regressions of leukaemic deposits should not be sought. They employ fractional doses of roentgeno-therapy, i.e., high-voltage therapy (from 180 to 200 kilovolts, 4 milliamperes, 0.5 mm. of copper plus 1 mm. of aluminium filter,

and the application of from 150 to 250 roentgens at each sitting). Under these conditions radiation is tolerated better, and fewer toxic reactions occur. In the myeloid cases the spleen was irradiated; in the lymphoid cases the lymph nodes and spleen. Only occasionally were the long bones or flat bones irradiated, and the authors believe that the response appeared to be somewhat slower. Contrary to the usual views, the authors hold that radiotherapy is justifiable and useful for acute leukæmias. It was used in 20 cases of their series, spleen, spine, and ribs being irradiated at three or four days' interval with 150 to 200 roentgens. In addition blood transfusion was given, to improve the anæmia prior to irradiation. In most of the cases no improvement resulted, but no harm was done; remissions were observed in three cases of acute leukæmia for some months. One of the patients recently treated was still alive eleven months later.

**Neurological Aspects of Leukæmia.**—Involvement of the central nervous system in leukæmia is thought to be rather an unusual complication, and is rarely mentioned in some of the standard text-books in medicine. R. S. Schwab and S. Weiss<sup>9</sup> publish evidence to show that this view cannot any longer be maintained. They report an interesting case of lymphatic leukæmia with an unusual presenting neurological picture. In addition, they have analysed the literature of the past fifty years, which reveals 146 cases of leukæmia with neurological signs, excluding retinal involvement. An analysis of the records of 334 cases of leukæmia in Boston revealed an incidence of 20·5 per cent with neurologic signs, excluding retinal lesions. The frequency of such complications in the acute and chronic types of leukæmia of both varieties is about the same. The most frequently observed neurologic signs are unilateral or bilateral palsies of the seventh and sixth nerves, less frequently involvement of other cranial nerves, absent knee reflexes, pyramidal signs, paræsthesias, and signs of meningeal irritation.

In 73·6 per cent of 34 cases in which the spinal fluid was examined, abnormal findings, as indicated by increased cell counts, increased protein contents, and elevated pressure, were present. In view of the frequent involvement of the central nervous system the authors state that blood examination should be done carefully in central nervous system diseases, and in leukæmias the central nervous system should be carefully examined.

**Leukæmic Retinitis.**—An analysis of the eye changes in 35 cases of leukæmia has been made by T. J. F. Frank.<sup>10</sup> The author found fundal changes in 71·4 per cent of the cases. The main retinal changes were tortuous dilated vessels and hæmorrhages. Papillœdema was observed in four cases. A case of chronic myelogenous leukæmia with gross papillœdema, which disappeared after X-ray treatment, is fully reported. The authors believe that the cause of the choked disc is retardation of the blood-stream, through the vessels being distended with white corpuscles, causing exudate and lymphatic obstruction in the lamina cribrosa. A plea, therefore, for the constant use of the ophthalmoscope is made.

#### THE HISTOPATHOLOGY OF THE HÆMOPOIETIC TISSUES.

Studies of the bone-marrow in thrombopœnic purpura, hæmophilia, and polycythæmia vera have been carried out by various workers in America.

The bone-marrow of 6 patients with *thrombocytopenic purpura* was studied by J. S. Lawrence and R. E. Knutti.<sup>11</sup> In 4 of these patients the authors were unable to find any abnormal changes of note in the bone-marrow. In 2 cases diminution of megakaryocytes was found. The authors admit that the bone-marrow might appear normal and yet be found not to function normally. Nevertheless, they say, it would be impossible to state that the

platelets were not destroyed after entering the peripheral circulation, and in that case the spleen was, in all probability, the most important centre for this destructive process. Hence splenectomy would be clearly indicated in certain cases of thrombopenic purpura.

R. P. Custer and E. B. Krumbhaar<sup>12</sup> have made a careful study of the bone-marrow in three fatal cases of *hæmophilia*. They found that in all cases the hæmopoietic tissues showed normal regenerative ability. In addition, however, a marked increase in megakaryoblasts and megakaryocytes was found, indicating a relationship of the blood platelets to the hæmophilic process. The authors did not find any unnatural thinness of the walls of blood-vessels, an item which has been claimed to be partly responsible for the hæmophilic process.

Seven specimens of bone-marrow from cases of *polycythæmia* have been examined by P. Reznikoff, N. Chandler, et al.<sup>13</sup> The authors found distinct capillary narrowing and thickening, in addition to some intimal and adventitial fibrosis of the subarterial capillaries, arterioles, and arteries. The vascular changes in the bone-marrow in *polycythæmia vera* patients suggest the possibility that these lesions may produce an anoxæmia of the bone-marrow, with compensatory *polycythæmia*.

#### AUTO-HÆMAGGLUTINATION.

The agglutination of a patient's red corpuscles by his own serum is a rare phenomenon. I. Sherman<sup>14</sup> says that he has observed it only three times in the course of typing and matching bloods in a series of 2000 transfusions. He surveyed the literature and says that he could only find 29 cases.

The importance of auto-agglutination from a practical point of view is that it makes the typing of blood extremely difficult. The influence of temperature is well recognized as an extremely important factor, and auto-agglutination in the great majority of cases disappears at blood-heat. It is advisable, therefore, if this phenomenon is observed, to allow the matching of blood to take place in the incubator.

All three cases reported by Sherman occurred in patients suffering from febrile infection. Re-examination, in one case, after recovery of the patient, showed diminution of the agglutinating power of the serum, so that it was absent at room temperature and only occurred in the ice-box. Two of the three patients received blood transfusion on five and two occasions respectively, without any untoward reaction.

#### THE BLEEDING TENDENCY IN JAUNDICE.

A. C. Ivy et al.<sup>15</sup> point out the great variability of the bleeding tendency in jaundice. Jaundiced patients with a normal bleeding time, normal coagulation time, and normal blood coagulating factors will frequently bleed abnormally after operation, and patients with abnormal findings may not bleed. Changes in blood calcium, fibrinogen, platelets, prothrombin and antithrombin, sedimentation rate, etc., are observed just as frequently without as with the hæmorrhagic diathesis in jaundice. There is undoubtedly a disturbed calcium metabolism in jaundice, such as altered calcium balance, osteoporosis, etc., but blood calcium levels, both fixed and diffusible, may be unchanged or only slightly changed. Furthermore, extravascular clotting has little relationship to the bleeding tendency, hence the difficulty in drawing conclusions from coagulation tests *in vitro*. Although intravenous calcium is much used as a pre-operative measure, the authors say it has not solved the problem of hæmorrhage in jaundice.

The authors tested the coagulation time in 115 normal individuals to obtain a standard. In 60 cases of jaundice and in 25 miscellaneous pathological cases the coagulation time was invariably found to be normal. In one case of jaundice with a prolonged coagulation time of 13 minutes, death occurred after operation, not from hæmorrhage but from cholæmia, which suggests that prolonged coagulation time in jaundice is not so much an index of bleeding tendency as of liver damage. With regard to the bleeding-time tests, the authors state that a latent bleeding tendency, such as is found in many cases of jaundice, is not revealed by the ordinary methods of skin puncture. This latent tendency may be brought into active operation by the anæsthetic and the shock of the operation. The authors, then, pay special attention in their studies to the tonicity of capillaries; they say that in small vessels it is the retraction of their walls, to a large extent, which stops bleeding. No other factor can explain the fact that the normal bleeding time of 30 to 180 seconds is much less than the normal coagulation time of 6 minutes. Accordingly they devised a test by which capillary tonus could be reduced or eliminated, and by this means it was hoped to demonstrate a latent tendency to bleeding. The cuff of a sphygmomanometer was applied round the arm with a pressure of 40 mm. Hg to cut off the venous return. The bleeding time of 115 normal individuals to whom this pressure was applied was found to be little altered. The upper limits of normal for venous pressure bleeding time was fixed at 240 seconds, although it was rarely over 180; but when the method was tried on a number of cases of jaundice, it was found that often, although the bleeding time before pressure was applied was normal, the venous pressure bleeding time was definitely prolonged. Those cases with prolonged venous bleeding time were almost always found to be cases that bled spontaneously, or after operation; 810 pathological cases were investigated, and this fact was demonstrated repeatedly. While the authors are not prepared to say exactly what mechanism is involved, they feel convinced that the method is of distinct value in predicting a hæmorrhagic diathesis in jaundice. [This seems to be an important practical advance in the diagnosis of the latent hæmorrhagic tendency in jaundice.—S. D.]

#### SPLenic ANÆMIA.

In an excellent address to the Edinburgh Medico-Chirurgical Society, J. McMichael<sup>16</sup> described his pathological investigations into 96 spleens, most of which were removed surgically from cases of so-called splenic anæmia. They fell into the following groups: hepatolienal fibrosis, 62 cases; acholuric jaundice, 13 cases; simple hypertrophy of the spleen, 6 cases; leuco-erythroblastosis, 4 cases; reticulo-endotheliosis, 4 cases; Gaucher's disease, 2 cases; tuberculosis of the spleen, 2 cases; tumours of the spleen, 3 cases. Fully two-thirds of the cases belonged to the group called 'splenic anæmia' or 'Banti's disease', but are best described as 'hepatolienal fibrosis' from the name introduced by Eppinger to describe an enlargement of the spleen characterized microscopically by an increase of connective tissue, and associated in most cases with the type of liver disease which usually ends in cirrhosis. McMichael again emphasizes the point that there is no criterion whereby the pathologist can differentiate the enlarged spleen occurring in association with cirrhosis of the liver from the pre-cirrhotic splenomegaly hitherto diagnosed as the first stage of Banti's disease. He reiterates his view that the primary site of the disease is the liver, inflammatory products from which pass via the thoracic duct, or through the permeable walls of the liver sinusoids, into the blood-stream; once in the blood-stream the only parts of the reticulo-endothelial system which they reach in any concentration are

the spleen and bone-marrow. The spleen, in other words, reacts to hepatic inflammation much as lymph glands react to inflammation elsewhere. Portal congestion he believes to be another important feature of the disease, produced usually by scar-contraction of the liver.

**TREATMENT.**—The aims of treatment, he states, are three-fold: the arrest of progress of the hepatitis, the cure or improvement of the anæmia, and the relief of special symptoms such as hæmatemesis. With regard to the first objective, the long chronic course makes it difficult to assess the value of *splenectomy* in arresting the advance of liver disease. Many cases have been reported in which the liver disease continued to progress, leading to a fatal termination at varying intervals after splenectomy. With regard to the anæmia, he submits figures which show hæmoglobin ranges before and at various intervals after splenectomy. His figures do not show striking improvements, particularly when the spontaneous fluctuations in hæmoglobin values which occur in the course of disease are remembered. In contrast with these figures, he quotes the excellent results reported by the reviewer in *The Lancet*, 1934, of cases treated with massive doses of *iron*. He is doubtful even if the risk of hæmatemesis is definitely improved by splenectomy. The operative risks are severe, as in a series of 37 cases of hepatolienal fibrosis there was an immediate mortality of 30 per cent, and 11 other cases died post-operatively of peritonitis, hæmorrhage, liver insufficiency, intraperitoneal hæmorrhage, and mesenteric thrombosis.

In conclusion, then, he says that the benefits of splenectomy are far from clear. The operation may afford some relief from portal congestion by cutting down the blood-flow in the portal veins, and by favouring the development of collateral circulation at the raw area left after removal of the spleen; it may also relieve the discomfort due to the dragging of the enlarged spleen. Evidence has been put forward by the reviewer in previous numbers of the *MEDICAL ANNUAL* to show that the beneficial results previously claimed for operation in splenic anæmia are more than doubtful. Nevertheless, R. C. Larrabee<sup>17</sup> holds that splenectomy is the method of choice, and claims that it makes no difference whether the splenomegaly is secondary to alcoholic cirrhosis or to some equally defined cause of portal obstruction. This author has made a study of 47 cases presenting the clinical picture of splenomegaly with fibrosis, hypochromic anæmia with leucopenia, and a late stage of hæmorrhages and ascites. He believes that the principal etiological factor is dependent upon various intra-abdominal lesions obstructing the venous outflow of the spleen; by far the commonest of these is liver cirrhosis of various types. An analysis of his case reports by the reviewer makes it doubtful if his claims regarding the benefits of splenectomy can be justified. Twenty-four cases were operated on; 29 per cent of these died within a few days, though the author says it should be remembered that most of these cases were derived from unfavourable material from a large municipal hospital and that several of them were in an advanced stage of the disease. Of the 27 cases operated on, only 7 were reported alive and well after periods varying up to seven years.

Apparently the view is still held in Vienna that splenectomy is the treatment of choice. E. Ranzi and L. P. von Avancini<sup>18</sup> reported a follow-up of 21 cases of splenomegalic cirrhosis. There were 3 operative deaths; 15 cases have been followed up, of which 1 made a long-lasting cure (20 years). Of the remaining 14 cases, with the exception of 2 which were in no way benefited, the authors claim that all showed a longer or shorter period of improvement. The reviewer has examined the data supporting this statement and finds that 7 of the cases lived only for from 2 months to 2 years, while 5 lived from

3 to 9 years. Most of the cases died of liver insufficiency. Equally good results can be claimed for simple medical treatment.

In conclusion it may be said that splenectomy cannot be relied on to stop the progress of the liver disease, cure the anæmia, or prevent hæmatemesis. The justification for such a serious operation requires further warrant before it can be accepted.

#### AGRANULOCYTOSIS (AGRANULOCYTIC ANGINA).

ETIOLOGY.—In last year's MEDICAL ANNUAL (p. 48) the etiology of this disease was fully reviewed. Accordingly it is necessary to refer to only a few of the numerous papers which have appeared since then. For an excellent article on the etiology and treatment, the reader is referred to a paper by H. Jackson, jun., and F. Parker, jun.<sup>19</sup> R. P. Custer<sup>20</sup> has made a careful study of the bone-marrow in 11 cases of idiopathic agranulocytosis. The essential feature in 9 of these was a marked proliferation of myeloblasts, with a failure of these cells to mature, resulting in a poverty of myelocytes and a practically complete absence of segmented forms. Red-cell formation was normal or slightly increased, and the same applies to the megakaryocytes. Degeneration and relative hypoplasia was noted in 2 cases, although the qualitative changes were similar to the other 9. In these cases it is suggested that the condition had lasted longer and infection played a part. The author concludes that the presence of a lesion of maturation, specifically confined to the granulopoietic series, not reduplicated by diseases of known etiology, entitles idiopathic agranulocytosis to a place as a disease entity.

The relation of *amidopyrin* and *allied drugs* to the etiology of agranulocytosis still continues to receive much investigation. P. Plum<sup>21</sup> is strongly in favour of the importance of such drugs as etiological agents. He states that since May, 1933, 128 cases have been reported in the literature in which agranulocytosis developed after therapeutic doses of amidopyrin; 70 of them were fatal. To show that the part played by amidopyrin is not merely accidental the author says it must be demonstrated that the administration of this remedy has actually caused the disease; this can be established only by demonstrating that amidopyrin in therapeutic doses produces granulocytopenia in the patient after his blood picture has returned to normal. The author then reviews a number of cases in which this has been clearly proved, and gives in great detail the investigations carried out on one of his own patients, who after recovery from agranulocytosis was given 0.20 grm. of amidopyrin by mouth in powder form. Repeated blood-counts at short intervals were made. The results produced were twofold: (1) On the blood: the total white count fell in one and a half hours from 9000 to 1900; in three hours there was an abrupt rise to 11,500; thereafter the cell-count again fell rapidly, till it reached a level of 2000 within twenty-four hours; this was followed through the next eight days by a gradual increase to normal levels. (2) In addition to the effect on the leucocytes there were some conspicuous changes in the condition of the patient, subjective as well as objective: within an hour of taking the drug she felt indisposed and had shivers of the extremities, which were aggravated during the next six hours, turning into severe chill. At the same time the temperature, which was taken every hour, rose to 104°, falling to a normal level in nine hours. The sedimentation-rate of the erythrocytes increased to 28 mm. in one hour, and the urine gave a positive urobilinogen reaction, even in dilutions of 1-50. The author then describes 7 cases of agranulocytosis arising from therapeutic doses of amidopyrin, 6 of them fatal, despite the injection of pentnucleotide and blood transfusion.

Since the etiological significance of amidopyrin has become the subject of general discussion in Denmark (August, 1934), no new case has been admitted to the Blegdams Hospital; during the same five months in 1933 a total of five patients were admitted. The reviewer is satisfied, however, that amidopyrin and allied drugs are of etiological importance only in individuals who have an idiosyncrasy to such drugs, as he has made a careful study of the effects of pyrimidon on individuals suffering from a variety of diseases, and finds that no toxic effects were produced in the bone-marrow when the drugs were given in pharmacological doses over a period of several weeks. Moreover, many authenticated cases of agranulocytosis have been reported in which the patients had never taken such drugs. This is well demonstrated in a paper by H. Jackson, jun.,<sup>22</sup> who studied 27 cases of agranulocytosis about which there was accurate and unequivocal evidence regarding the administration of amidopyrin and allied drugs. The author concludes that in 26 per cent of the cases studied the disease followed the administration of amidopyrin or allied drugs. That in these instances the disease may have been actually caused by the therapy is possible, perhaps probable. In 30 per cent of the cases a critical examination of the evidence shows that in spite of the fact that these drugs were taken in considerable quantities, they definitely had no causative relation to the disease. Thirty-four per cent of the patients received no drugs of this type whatsoever, yet their clinical and hæmatological pictures were similar in every respect.

The reviewer feels that it is necessary to warn the practising members of the profession against any undue scare regarding the dangers of employing such valuable drugs. It is impossible to distinguish those who have an idiosyncrasy to these drugs, except by a blood examination and watching the effects of treatment. The earliest clinical symptoms of granulopenia are said to be weakness, exhaustion, fatigue, and a tendency to sleep. Such symptoms occurring, particularly in middle-aged women, should suggest the withdrawal or the withholding of the amidopyrin group of drugs until an enumeration of the white blood-corpuscles has been undertaken.

**TREATMENT.**—*Pentnucleotide*\* given intramuscularly and intravenously, as described in the MEDICAL ANNUAL, 1934 (p. 16), is still believed to be the best method of treatment available. Blood transfusion would appear to be of value as well, and in severe cases should be used in conjunction with pent-nucleotide. In fulminating cases with white cell counts under 1000, more than 50 per cent of the patients die, no matter what treatment is instituted. Although nucleotide treatment, then, should be tried, it must be clearly understood that the high hopes originally expressed regarding its specific action have not been realized, as is exemplified by the reports of D. Hall,<sup>23</sup> who treated 4 cases with 100 per cent mortality, and by P. Plum,<sup>21</sup> who had 6 deaths out of 7 cases.

#### THE IRON-DEFICIENCY ANÆMIAS.

**Prevalence and Age and Sex Incidence.**—Observations are reported by L. S. P. Davidson et al.<sup>24</sup> on the hæmoglobin levels of 3500 individuals of both sexes and all ages belonging to the poorest classes in Aberdeen and the North-East of Scotland. A study of the graph shown in *Fig. 7* makes it apparent that anæmia is relatively infrequent and of minor clinical importance, except at two age-periods—infants between the 11th and 23rd month of life, and adult women. The incidence of anæmia is highest in women of the reproductive

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\* Obtainable from Menley & James Ltd., 64, Hatton Garden, London, E.C.1.



age who have borne children, and is most marked in the latter part of this period. The same finding is obtained among pregnant women. The high incidence of anæmia in women, in contrast with its absence in men of the same social status, is striking, and justifies the conclusion that a physiological demand for iron, conditioned by pregnancy and menstruation, is not satisfactorily supplied by the diets of many women of the poorest classes—hence the term ‘nutritional anæmia’ would appear to be justified.

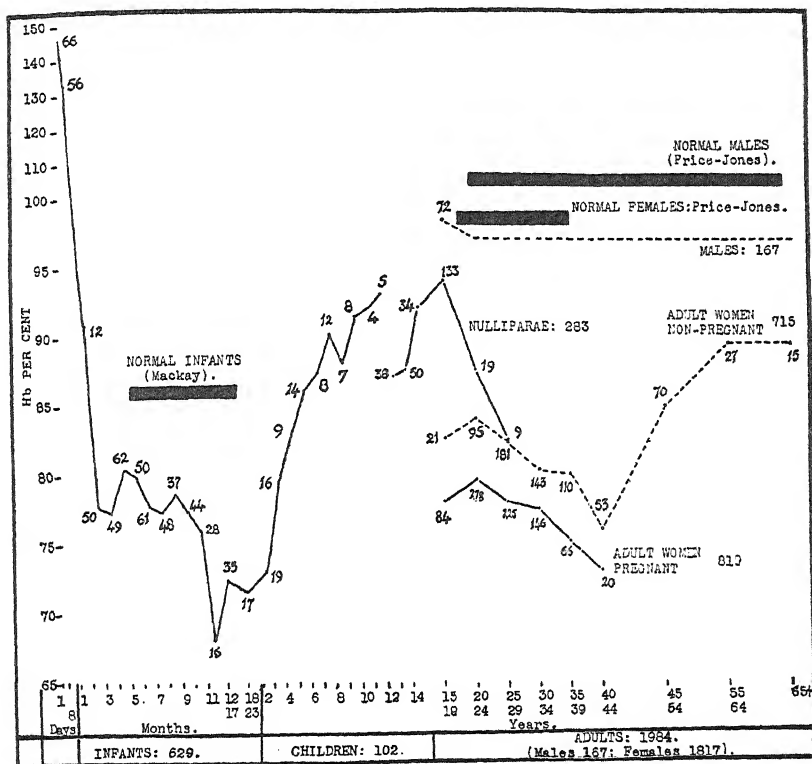


Fig. 7.—Chart showing average hæmoglobin level among poor persons of all ages and both sexes. (By kind permission of the 'British Medical Journal'.)

41 per cent of infants under two years, and 45 per cent of adult women, were anæmic; as against 2 per cent of school children and an absence of anæmia in adult men. Great interest attaches to the figures for adolescents: 320 adolescents between the ages of 12 and 18, belonging to the poorest classes, were examined. Of these, 74 were males, and the average hæmoglobin level was approximately 100 per cent; no figure under 85 per cent was obtained. Of 246 adolescent girls, only 16 per cent fell below 85 per cent hæmoglobin, and only 5 per cent were moderately anæmic (hæmoglobin between 70 and 79 per cent), and 1 per cent severely anæmic (hæmoglobin less than 70 per cent). If chlorosis exists to any degree at the present day, it should have been found in this group, and the rarity of severe anæmia in these 246 adolescent

girls of the poorest classes proves that chlorosis of the type common thirty years ago has practically disappeared.

A further two years' study of the problem has produced no information which would induce the authors to alter their conclusions published in 1933—namely, that an iron-deficiency nutritional anæmia occurs with great frequency among women of the poorest classes, leading to much loss of economic efficiency and health, and that this anæmia can be adequately and cheaply treated by the administration of iron salts.

H. M. M. Mackay<sup>25</sup> found the average hæmoglobin level of 368 women of the hospital class to be 85 per cent, as estimated by the Haldane hæmoglobino-meter. This figure is 13·7 per cent lower than the average figure for healthy women according to Price-Jones. The degree of anæmia among the women was of a similar order to that existing among babies of six to twelve months old, of the same social order. Mackay had previously found that the anæmia of babies is sufficient to double their morbidity rate, and suggests by analogy that it is probable that a similar factor may be present in lowering the resistance to infection among women. Accordingly routine iron therapy of expectant mothers and babies is urged.

M. Davis and E. W. Walker<sup>26</sup> tested the value of iron treatment during pregnancy, by estimating the hæmoglobin values of two groups of pregnant women, one of which received iron while the other proceeded to term untreated. The untreated group consisted of 161 pregnant women, 33 per cent of whom had a hæmoglobin of 70 per cent or less, and a red cell count of 3,500,000. The treated group consisted of 131 pregnant women, of whom 90 per cent had anæmia. The anæmia was progressive during pregnancy, followed by moderate spontaneous recovery after delivery. Treatment improved the anæmic condition and made possible a more speedy recovery after delivery, hence they recommend routine examination of all pregnant women for anæmia. The authors state that there were more premature deliveries, a greater number of toxæmias, a higher fetal mortality, a higher morbidity, and a longer labour in the untreated cases; they are not yet prepared to say positively what influence anæmia and its treatment have upon these conditions.

**Bile Pigment in Hæmoglobin Regeneration.**—Nine selected patients with chronic hypochromic anæmia were studied by A. J. Patek and G. R. Minot,<sup>27</sup> to determine whether bile pigment could assist hæmoglobin production. Concentrated bile pigment alone caused, not a reticulocyte response, but an increase of hæmoglobin, about 7 per cent in ten days. This indicates that in certain anæmic patients bile pigment can be absorbed from the gastro-intestinal tract for building hæmoglobin. If a suboptimal dose of iron were first given and then bile pigment fed with the same dose of iron a few days later, a response was obtained of greater magnitude than that obtained by the suboptimal doses of iron given alone. This indicates that bile pigment, in some unknown manner, can facilitate either iron absorption or utilization. In one patient who could not obtain in fourteen months a normal hæmoglobin level with large doses of iron, an increased hæmoglobin concentration was obtained when bile pigment was fed in addition to the iron.

This work is principally of physiological interest, since practically every case of hypochromic anæmia will respond to iron treatment, if iron in sufficient doses is given.

**TREATMENT.**—From the papers above reviewed it is apparent that an iron-deficiency anæmia is extremely common, particularly among women of the working classes. Every practitioner should clearly remember this, and he will be rewarded by the excellent therapeutic results which he will obtain

from the administration of adequate *iron* therapy, and by the gratitude of his patients. Iron and ammonium citrate, 20 to 30 gr. three times daily; Blaud's pills, 30 to 45 gr. daily; or any of the tablets containing ferrous sulphate chloride or carbonate, in 3-gr. doses three times a day, can be used with the certainty of good results. Failure to improve after a month on such treatment should indicate that bleeding is proceeding, or that serious hidden organic disease is present in the patient.

**Ankylostoma Anæmia.**—A. G. Biggam and P. Ghalioungui<sup>28</sup> have shown that doses of *iron* can correct ankylostoma anæmia, even when the patient is still harbouring the worms. The removal of the worms alone produces little or no change in the blood picture. Nevertheless *anthelmintic treatment* should be employed, since the anæmia is liable to recur if the worms are not removed. It is not clear whether the hypochromic anæmia results from occult bleeding in the intestinal tract or from interference with the absorption of iron from the food. It is of interest that an analogous condition occurs in the megalocytic anæmia which results from fish tapeworm infestation, in which liver extract will produce a normal blood picture without removal of the worms.

#### HÆMOPHILIA.

An example of apparent spontaneous hæmophilia in six brothers is reported by R. Boggs.<sup>29</sup> A large family-tree on the mother's side practically precludes the possibility of concealed inheritance. Hæmophilia is generally regarded as a hereditary constitution, sex-linked and recessive. It appears only in males and is transmitted characteristically through the females. Under the title "Hereditary Pseudo-hæmophilia", R. S. Handley and A. M. Nussbrecher<sup>30</sup> describe a family in which the classical symptoms of hæmophilia appear in women. Clotting-time was prolonged and bleeding-time was found to be normal, as in true hæmophilia.

**TREATMENT.**—An excellent article on the treatment of hæmophilia is published by H. W. Jones and L. M. Tocantins.<sup>31</sup> The authors rightly draw attention to the difficulty in statistically evaluating the merits of any form of treatment owing to the rarity of the disease. For assessing the criteria of improvement, they state that changes in the course of the disease in general may best be gathered from the patient's own history of increase or diminution in frequency and severity of the attacks of bleeding and acute joint disturbances. Determination of the venous and capillary clotting-time gives little idea of the progress of the disease, and is therefore of little practical use from this standpoint. When blood transfusion is used to prepare the patient for surgical procedure, however, the venous clotting-time may be relied on as an indication of its effectiveness. The treatment of hæmophilia may be divided as follows: (1) Preventive; and (2) Treatment of the condition itself. (a) Attempts to influence the general course of the disease, or permanently change the fundamental defects of the blood, i.e., the coagulation factors; (b) The treatment of the acute hæmorrhagic phase; and (c) The treatment of complications. In view of the prominence of the hereditary character of hæmophilia, an effort should be made by eugenic methods to control its spread. Prophylaxis of attacks of bleeding is obtained by the avoidance of trauma and by proper preparation for the undertaking of any operative procedure. During the acute phase of the attack, the therapeutic measure, *par excellence*, is a *transfusion of blood*, unmodified or citrated. Sometimes the intramuscular injection of 30 to 50 c.c. of whole blood is of value. Improvement from blood transfusion lasts from two to six days. In children the intraperitoneal transfusion of blood is of equal benefit as a pre-operative measure.

The authors discuss the value of various sera from animals, as well as commercial hæmostatic sera, and the use of drugs, such as calcium, ergot, parathyroid extract, thromboplastic substance, œstrogenic substance, etc., and come to the conclusion that they are of no value in altering the course of the disease, and are really a danger, since their use involves delay in the employment of measures of proved value. For the control of local bleeding in accessible portions of the body, *pressure* is helpful if it is applied for one hour or longer. This may require special bandages. A pyramidal pack (a series of superimposed small gauze layers) soaked in fresh blood or serum should be applied and pressure made on the entire pack. Fresh serum, not over three hours old, is the best. *Tannic acid* is another substance which they recommend. Under treatment of the complications is included severe anæmia, which responds to *diet* and *iron*; no hæmatoma, no matter how large, or swollen joint, should be opened; orthopædic treatment, by splinting until the swelling and pain disappear, is the rational procedure. After the acute symptoms have subsided, heat, gentle massage, and passive motions are indicated.

*Endocrine Glandular Therapy.*—W. B. Chew, R. F. Stetson, et al.<sup>32</sup> studied two cases of hæmophilia for many months during which control periods with no specific treatment were interspaced with periods of treatment with preparations of œstrogenic substance by mouth and subcutaneously, the hormone of corpus luteum intramuscularly, and the gonad-stimulating hormone from the urine of pregnant women subcutaneously. The administration of such hormones to these patients with hæmophilia was not associated with a demonstrable improvement in the clinical picture, nor with a significant diminution of the coagulation time of the blood.

*Treatment of Hæmorrhagic Diathesis with Snake Venom.*—Two different venoms have been used: *Russell's Viper Venom* was introduced into this country by R. G. Macfarlane and B. Barnett.<sup>33</sup> *Moccasin Snake Venom* has been given intradermally or subcutaneously by S. M. Peck and N. Rosenthal.<sup>34</sup> The Viper Venom has been used extensively in St. Bartholomew's Hospital, as a local application to bleeding points in many different forms of the hæmorrhagic diathesis, and is claimed to be the best hæmostatic available. The dangers of severe bleeding following small operations in hæmophilic patients have been greatly reduced by the use of this venom, but it cannot be used for internal hæmorrhages. Peck and Rosenthal claim that the injection of Moccasin Snake Venom has a definite effect in decreasing the permeability of capillaries, and as such it is stated to be of value more particularly in hæmorrhagic states other than hæmophilia or idiopathic thrombo-cytopenic purpura. Insufficient data, however, have been published as yet to draw any definite conclusions regarding the value of snake venom in the control of bleeding.

#### CONGENITAL HÆMOLYTIC JAUNDICE (ACHOLURIC JAUNDICE).

*ETIOLOGY.*—R. L. Haden<sup>35</sup> believes that the fundamental variation from normal in congenital hæmolytic jaundice is microspherocytosis of the erythrocytes. In support of this hypothesis he gives his measurements of the size and shape of the erythrocyte in different clinical conditions and in different animals (*Figs.* 8, 9). Increased fragility was found to run parallel to increased spherocytosis. Red cells suspended in different strengths of salt solution were shown to have different thicknesses; hæmolysis starts when a certain stage of spherocytosis is reached. Since the erythrocytes in acholuric jaundice are delivered into the circulation with a thickness considerably

greater than normal, much less dilution of the plasma is necessary to bring them to the shape at which hæmolytic takes place. The fundamental abnormality in acholuric jaundice is an inherited defect in the erythron. The

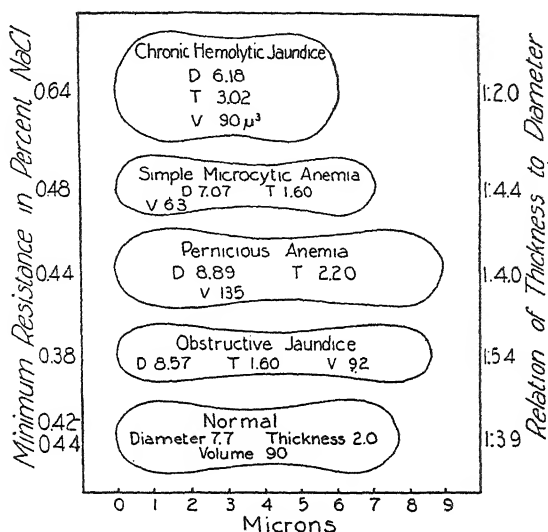


Fig. 8.—Cross-sections and measurements of mean erythrocyte in different clinical conditions.

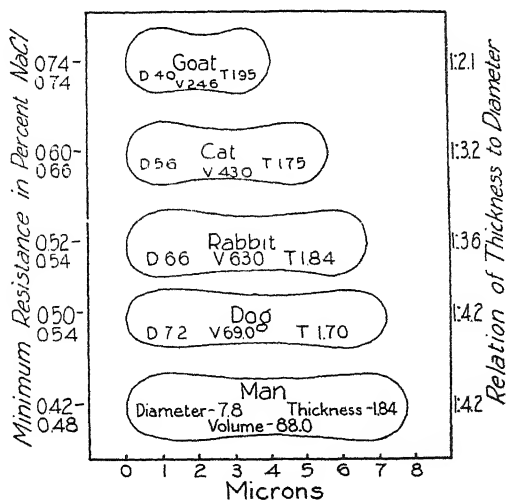


Fig. 9.—Cross-sections and measurements of the mean in different animals in relation to fragility.

(Figs. 8, 9 by kind permission of the 'American Journal of the Medical Sciences'.)

anæmia, jaundice, splenomegaly, reticulocytosis, and increased fragility are all secondary to the globular form of the red cell.

REFERENCES.—<sup>1</sup>*Brit. Med. Jour.* 1935, i, 139, 194; <sup>2</sup>*Ulster Med. Jour.* 1935, iv, April, 69; <sup>3</sup>*Ibid.* 79; <sup>4</sup>*Arch. of Internal Med.* 1934, liv, July, 11; <sup>5</sup>*Amer. Jour. Med. Sci.* 1934, clxxxviii, Nov., 609; <sup>6</sup>*Ibid.* 612; <sup>7</sup>*Jour. Amer. Med. Assoc.*, 1935, civ, March, 697; <sup>8</sup>*Ibid.* 702; <sup>9</sup>*Amer. Jour. Med. Sci.* 1935, clxxxix, June, 766; <sup>10</sup>*Med. Jour. Australia*, 1935, xxii, March, 364; <sup>11</sup>*Amer. Jour. Med. Sci.* 1934, clxxxviii, July, 37; <sup>12</sup>*Ibid.* 1935, clxxxix, May, 620; <sup>13</sup>*Ibid.* June, 753; <sup>14</sup>*Ibid.* 1934, clxxxviii, Oct., 487; <sup>15</sup>*Surg. Gynecol. and Obst.* 1935, lx, April, 781; <sup>16</sup>*Edin. Med. Jour.* 1935, xlii, June, 97; <sup>17</sup>*Amer. Jour. Med. Sci.* 1934, clxxxviii, Dec., 745; <sup>18</sup>*Wien. klin. Woch.* 1935, xlviii, 637; <sup>19</sup>*New Eng. Jour. Med.* 1935, cccii, Jan., 137; <sup>20</sup>*Amer. Jour. Med. Sci.* 1935, clxxxix, April, 507; <sup>21</sup>*Lancet*, 1935, i, 14; <sup>22</sup>*Amer. Jour. Med. Sci.* 1934, clxxxviii, Oct., 482; <sup>23</sup>*Lancet*, 1934, ii, 1441; <sup>24</sup>*Brit. Med. Jour.* 1935, ii, 195; <sup>25</sup>*Lancet*, 1935, i, 1431; <sup>26</sup>*New Eng. Jour. Med.* 1934, ccc, June, 1315; <sup>27</sup>*Amer. Jour. Med. Sci.* 1934, clxxxviii, Aug., 206; <sup>28</sup>*Lancet*, 1934, ii, 299; <sup>29</sup>*Amer. Jour. Med. Sci.*, 1934, clxxxviii, Dec., 811; <sup>30</sup>*Quart. Jour. Med.* 1935, iv, April, 165; <sup>31</sup>*Jour. Amer. Med. Assoc.* 1934, ciii, Dec., 1671; <sup>32</sup>*Arch. of Internal Med.* 1935, lv, March, 431; <sup>33</sup>*Lancet*, 1934, ii, 985; <sup>34</sup>*Jour. Amer. Med. Assoc.* 1935, civ, March 30, 1066; <sup>35</sup>*Amer. Jour. Med. Sci.* 1934, clxxxviii, Oct., 441.

## BLOOD TRANSFUSION.

Sir W. I. de C. Wheeler, F.R.C.S.I.

The transfusion of *unmodified blood* still remains the ideal, but the difficulties under ordinary circumstances and in emergency are so great that most surgeons employ the citrated method. Some urge that the beneficial effect is the same; but most feel that if a simple technique for the administration of unchanged blood could be evolved it would be used to the exclusion of other methods. M. DeBakey<sup>1</sup> outlines some of the difficulties of whole blood transfusion. Insertion of the needles into donor and recipient is the most difficult part of the procedure. He recommends a needle consisting of a cannula and obturator. The latter has a sharp cutting point, which guides the cannula into the vein. Once in position, the cannula can be inserted further into the vein without fear of injury to the vein wall. If the veins of the recipient are too small or collapsed or hidden by fat, it is necessary to expose them. The internal saphenous just anterior to the medial malleolus is often accessible when the veins of the antecubital fossa are obscure, and it is usually the best vein to select in the case of young children. DeBakey thinks that this vein is so readily found in infants that it is never justifiable to use the anterior fontanelle. The incision in the skin (after the raising of an endermic wheal with novocain) is made at right angles to the vein. The incision is never more than  $\frac{1}{4}$  in. long. Two ligatures of fine catgut are placed round the vein with an aneurysm needle. The distal one is tied and used as a tractor. The vein is nicked with a fine manicure scissors and the cannula inserted. The proximal ligature is tied at the completion of the transfusion. When the needle enters the vein of the donor a free flow of blood indicates that there has been proper penetration; if the blood only drips, a second puncture should be made. Before each transfusion sterile mineral oil is pumped through the assembled instrument and then washed out with saline solution. There are numerous simple syringes on the market with a valvular arrangement so that the blood can be 'sucked' from the donor and injected into the recipient in a simple manner. If the rubber tubing connecting the needles together with the syringe are carefully cleansed and oiled with mineral oil, clotting does not take place.

Transfusions with *post-mortem blood* has been suggested lately by many writers (M. Skundina<sup>2</sup>). The blood was obtained from cadavers who died from angina pectoris or alcoholic poisoning, or from suicides or those killed in accidents. The blood is obtained from the jugular vein. Two cannulae are introduced, one directed proximally, the other distally. The blood may be withdrawn six or seven hours after death without danger of infection. In some cases the blood was preserved for as long as twenty-eight days. In

90 per cent of cases the blood transfused belonged to the same group as that of the patient. In 10 per cent it belonged to the universal group. Precautions with regard to the Wassermann reaction are taken.

REFERENCES.—<sup>1</sup>*Amer. Jour. Surg.* 1935, xxvii, Jan., 85; <sup>2</sup>*Surg. Gynecol. and Obst.* 1934, lix, Dec., 547.

**BLOOD-VESSELS, SURGERY OF.** (See also BLOOD TRANSFUSION; FAT EMBOLISM; PULMONARY EMBOLISM; VARICOSE VEINS.)

*Sir W. I. de C. Wheeler, F.R.C.S.I.*

**Simultaneous Vein Ligation.**—The idea of vein ligation when it was found necessary to ligate the corresponding artery following injury or in cases of aneurysm was developed during the War. Makins was one of the chief pioneers. It was thought that more blood would remain in the parts involved below ligation of a main artery if the vein also was occluded. In any case where there has been time for the development of arterial collateral circulation, even although this is not sufficient to maintain vitality, ligature of both artery and vein appears to be a safe and effective procedure. A further trial of sympathectomy by resection of the artery as a means of producing vasodilatation in the vessels below during a critical period might give valuable information. (Wheeler, *Surg. Gynecol. and Obst.* 1933, Feb., p. 11.)

B. Brooks and G. S. Johnson<sup>1</sup> give a summary of their experimental results as follows :—

	ARTERY ALONE LIGATED	ARTERY AND VEIN LIGATED
Total number of experiments ..	100	100
Slight muscle or temperature changes	33 per cent	56 per cent
Complete paralysis .. .. .	66 "	44 "
Focal gangrene .. .. .	17 "	2 "
Massive gangrene .. .. .	29 "	2 "
Late ulceration .. .. .	7 "	0 "
Contracture .. .. .	15 "	4 "

In their clinical experience deliberate ligation of a healthy vein has been performed 17 times. In 2 instances in which there was localized arterial obstruction with active progress of gangrene, it seemed that the immediate and marked improvement could hardly be attributed to anything other than the venous occlusion. In 14 instances of arterial obstruction due to arteriosclerosis the results obtained were such as to suggest a possible beneficial effect in some instances, but they believe one can expect a favourable result in only a relatively small proportion of carefully selected patients. They know of no evidence which would indicate that any beneficial results could be expected from therapeutic vein ligation in thrombo-angiitis obliterans.

**Gangrene of the Extremities: Arteriography.**—J. R. Veal and E. M. McFetridge<sup>2</sup> discuss adequate circulation in the extremities and amputation when the circulation fails. The question is often not whether to amputate but where to amputate. If the amputation is high to ensure good circulation, the mortality-rate is raised. The mortality is in direct proportion to the nearness of amputation to the trunk. Apart from the decreased economic usefulness of a high amputation and the difficulty of fitting an artificial limb, routine high amputation is no solution to the problem. The 'sleeve' amputation is indicated in selected cases. (See MEDICAL ANNUAL, 1932, p. 22.)

Veal advocates the more extended use of direct visualization of the arterial

supply by means of *arteriography* with a stabilized solution of thorium dioxide. In 200 cases there were no immediate or remote harmful results. The method is on its trial and some of the hopes entertained have not materialized; it is a field which with further development may be fruitfully explored. Veal and McFetridge say:—

“Our technic, which we have described in detail in previous communications, we need mention only briefly. The patient lies on the table with the involved limb rotated outward, the leg partially flexed on the thigh, and the knee flat against the X-ray plate. In this position it is possible to visualize on a 14 by 17 film the upper two-thirds of the leg and the lower third of the thigh, which is usually all that is necessary. Under local analgesia the femoral artery is punctured in the femoral triangle, and by digital pressure, applied just proximal to the site of puncture, the artery is occluded until the thorium dioxide solution has been introduced, firm pressure being continued until the injection has been completed. At the end of three seconds, which allows sufficient time for the solution to be distributed throughout the larger trunks and the smaller branches of the arterial tree, the exposure is made by the technic advised by Dr. Amédée Granger of the Department of Radiology, who has cooperated with us throughout this study: 45 milliamperes, 90 kilovolts, 35 inches, one second. The average dose of thorium dioxide is 20 c.c.; 15 c.c. is often sufficient, and we have never found it necessary to use more than 30 c.c. Even this maximum quantity, it should be noted, is several times less than the dosage established as well within the limits of safety by investigators of unquestioned verity who have used this agent in visualization of the liver and spleen. The injection is painless and non-irritating, and we have never seen the slightest evidence of arteritis or thrombosis, or any other untoward effect. We make very guarded claims for the worth of arteriography. We by no means claim that the marked reduction in mortality which this group of thirty cases shows, as compared to the mortality we recently reported in a group of 171 cases of gangrene, 23.3 per cent against 39.1 per cent, is entirely, or even chiefly, due to its use. It is only fair to point out that the majority of these amputations were done in our own service, in which it is the policy of the entire staff to surround with every possible protection the patient who has gangrene. We amputate without delay in the presence of frank gangrene, we prepare the patient carefully by the use of fluids by all routes, our post-operative care is equally meticulous, we check the cardiac and renal reserve in all cases, and we handle diabetic gangrene only with the close cooperation of a competent internist. But we do claim that the use of this test, in conjunction with other tests the worth of which has been established, and in conjunction with the proper pre-operative and post-operative therapy, will furnish one more safeguard for the patient with gangrene of the extremities. Furthermore, since the harmlessness of the stabilized solution of thorium dioxide has been established, and since the injection is only slightly more complicated than the taking of a simple roentgenogram, we can see no objection to the employment of the method at least in those clinics in which radiography of the extremities is part of the routine of the management of peripheral vascular disease.” (*Plate V.*)

The same writers<sup>3</sup> say, with regard to amputation in arteriosclerotic disease, that with the exception of ether the type of anæsthetic seems to play no part in the mortality, but the type of operation does. A simple circular amputation is recommended.

E. V. Allen and J. D. Camp<sup>4</sup> also discuss arteriography. Their technique is as follows:—

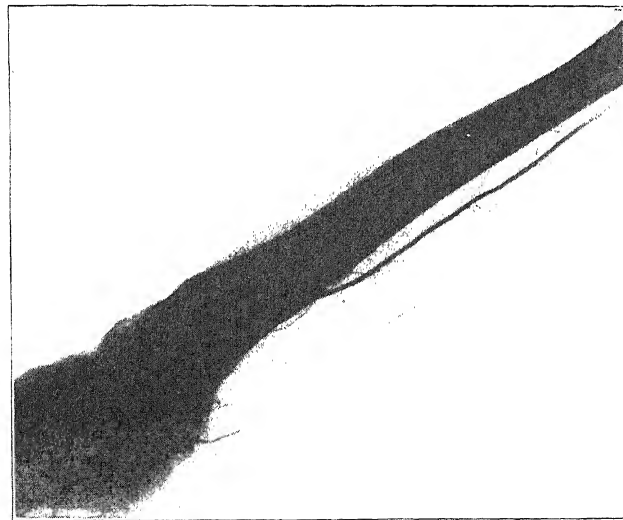
#### TECHNIQUE.—

“*The Upper Extremities.*—The patient lies on the roentgenographic table with

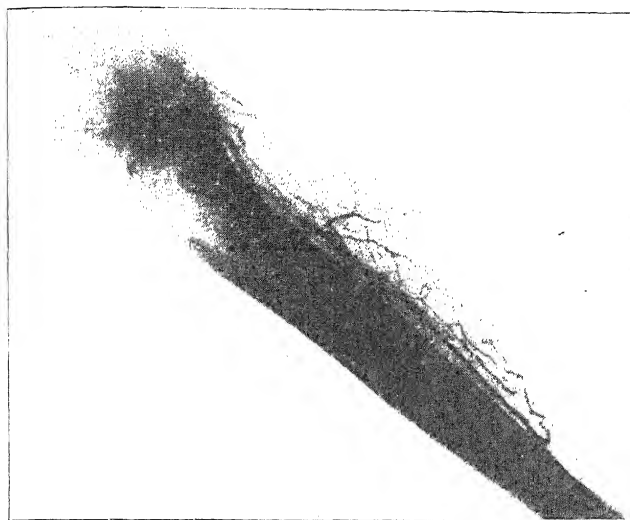


# PLATE I—ARTERIOGRAPHY

(J. R. VEAL AND E. M. McFETRIDGE)



*Fig. A.*—Diabetic gangrene of toes, with obliteration of anterior tibial artery but adequate circulation to upper half of leg. Amputation at site of election, with prompt healing.



*Fig. B.*—Arteriosclerotic gangrene of foot with partial obliteration of tibial arteries but adequate collateral circulation. Amputation at site of election, with prompt healing.

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# PLATE VI—ARTERIOGRAPHY, continued

(E. V. ALLEN AND J. D. CANT)

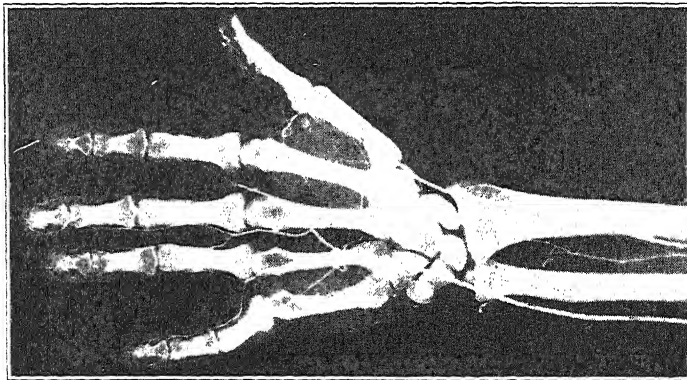


Fig. A.—Arteriogram showing the smooth outline and direct course of normal arteries. The collateral circulation is minimal.

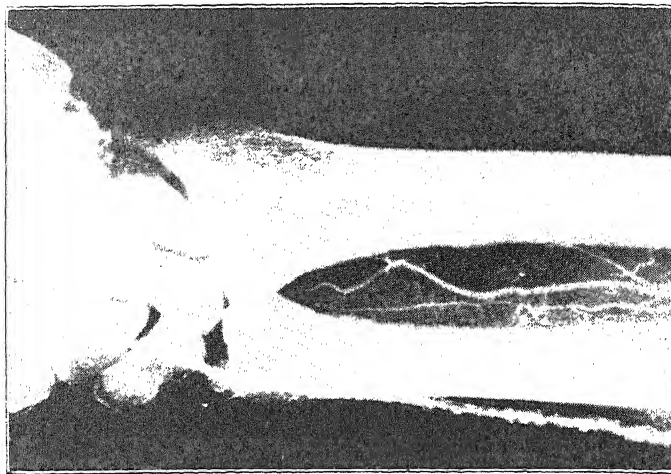


Fig. B.—Arteriosclerosis. The radial and ulnar arteries are shaggy and tortuous in appearance and the lumens are reduced in size.

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the film under the outstretched, supinated arm. An ordinary sphygmomanometer cuff is wrapped about the arm as near to the shoulder as possible. Under aseptic conditions the skin and the tissues around the brachial artery, just above the lacertus fibrosus, are anaesthetized with 1 or 2 c.c. of solution of procaine, 0.5 per cent. The brachial artery is then entered with an ordinary venipuncture needle attached to a syringe containing the radiopaque material; as soon as the point of the needle is well within the lumen of the artery, and bright red blood pulses forcibly into the barrel of the syringe, the sphygmomanometer cuff is rapidly inflated above the systolic blood-pressure and the radiopaque material is injected. The needle is quickly withdrawn, and as pressure is made over the point of puncture to stop any transient leakage, the first roentgenogram is made. The sphygmomanometer cuff is now quickly deflated to the level of the diastolic blood-pressure for a period of two to four pulse beats, to permit the injected material to be carried more distally. Then the cuff is quickly reinflated to its previous pressure, and the second roentgenogram is made. The procedure is repeated for a third film. The cuff is now removed, and with a gauze sponge firm pressure is made over the point of puncture for a few minutes. Additional films, with the forearm in pronation or in the lateral position, may be made before the cuff is finally deflated.

*"The Lower Extremities.*—The skin and tissues about the femoral artery, just below the inguinal ligament, are anaesthetized. The artery is punctured in the same manner as the brachial artery; the lumen is occluded above the point of puncture by pressure of an assistant's fingers; the medium is injected, and a film is exposed. The assistant lessens the pressure on the artery, allowing a small amount of blood to flow, and occludes it again by pressure while a second roentgenogram is made. The procedure is then repeated for a third film."

Illustrations are given in this communication of cases of arteriosclerosis, thrombo-angiitis obliterans, arteriovenous fistula, and popliteal aneurysm which were visualized by arteriography (*Plate VI*). The writers state that obstruction from arterial emboli can also be determined accurately.

**Arteriosclerosis.**—R. W. MacNealy and P. F. Shapiro<sup>5</sup> state that the vascular involvement of old age is not patchy as in Buerger's disease, but uniform. It strikes not only one or two branches of the vascular tree at a time but the whole tree at once with all its finest twigs. The margin of collateral safety is very small. Gangrene is generally precipitated by thrombosis or infection. Amputation may be withheld for a long time unless there is evidence of spreading infection, a large area of gangrene, or intractable pain. Amputation of one or more toes will suffice for the minimal lesions. If, however, the dorsalis pedis and posterior tibial arteries are not pulsating, and there is an absence of a warm foot and good colour, mid-leg or higher amputation must be done. A greater margin of collateral safety is required in arteriosclerosis than in Buerger's disease. It is especially urgent that a mid-leg rather than a thigh amputation be done when possible if the condition of the other foot is such that subsequent trouble seems probable. About 6 in. below the tubercle of the tibia is the best site for amputation. The elective thigh amputation is 3 in. above the knee. This latter is indicated when popliteal pulsation is absent and the skin is not warm and of good colour in all positions down to the ankle. It is indicated when the patient is over 60 years of age and in poor general condition or in cases of rapidly spreading infection.

**Thrombo-angiitis Obliterans.**—S. Silbert<sup>6</sup> recommends the treatment of this condition by repeated injections of *hypertonic salt solution*. He gives a

record of 524 cases. The solution used is 5 per cent sodium chloride in freshly distilled water. Immediate sterilization is important as bacteria grow readily in distilled water. The initial dose is 150 c.c. given by the gravity method into a superficial vein at the elbow. The solution is allowed to run in slowly, about ten minutes being the usual time. All subsequent injections are 300 c.c. The injections are given three times a week at first, later twice a week. The intervals are further increased as the patient improves. The length of treatment varies from six weeks to two years. Silbert thinks that the rôle of tobacco as the exciting cause of the disease cannot be doubted. Cessation of smoking is the most important part of the treatment. Silbert does not give the rationale of the treatment, but his results are convincing.

(See also ARTERIES, PERIPHERAL, DISEASE OF.)

**Embolectomy.**—In about 60 per cent of cases the blockage of an artery from embolus is due to a cardiac lesion. Gangrene follows embolism and thrombosis in the lower extremity more often than in the upper. The history of the case is often characteristic. The patient has a cardiac lesion, some mild infection is usually superimposed. Pain suddenly develops along the course of a main vessel, followed by numbness, tingling, and gradual loss of muscular power. The skin becomes blanched, with irregular patches of ecchymosis and cyanosis. There is absence of pulsation in the affected vessel, and gangrene soon follows. If it is possible to locate the point at which pulsation stops, the level of the embolic obstruction can be accurately gauged. This level otherwise is not easy to estimate. The most common site is near an arterial bifurcation. Arteriography may be tried. *Embolectomy*, if performed early, has given many good results, and is the only possible operation when the aorta or other very large arteries are involved. It has been shown that in certain cases arteriectomy, i.e., complete excision of the obstructed segment of the vessel, may be a more feasible operation, and it has given good results (MEDICAL ANNUAL, 1935, p. 55). Probably the sympathectomy (peri-arterial) which of necessity accompanies excision of an artery and the vasodilatation which follows in the branches below is an important factor in improving the circulation.

G. Jefferson<sup>7</sup> reports five cases of embolectomy. He refers to Carrel's experimental work which demonstrated that, given a careful technique, very fine silk suture material, and the use of anticoagulants in the wound, vessels could be incised and closed again without thrombosis at the suture line. The artery should be exposed with as little delay as possible. The time factor is important because secondary clot formation takes place in the vessel beyond the embolus after a few hours but not immediately. Local anaesthesia as opposed to spinal anaesthesia is essential, as the patients' subjective sensations are a good indication in deciding whether success has been achieved.

REFERENCES.—<sup>1</sup>*Ann. of Surg.* 1934, Oct., 761; <sup>2</sup>*Jour. Amer. Med. Assoc.* 1935, civ, Feb. 16, 542; <sup>3</sup>*Surg. Gynecol. and Obst.* 1935, lx, April, 840; <sup>4</sup>*Jour. Amer. Med. Assoc.* 1935, civ, Feb. 23, 618; <sup>5</sup>*Surg. Gynecol. and Obst.* 1934, lxx, Oct., 650; <sup>6</sup>*Ibid.* 1935, Aug., 214; <sup>7</sup>*Brit. Med. Jour.* 1934, ii, 1090.

**BONE TUMOURS.** (See also CANCER, RADIOTHERAPY OF; X-RAY AND RADIUM THERAPY.)

E. W. Hey Groves, M.S., F.R.C.S.  
K. H. Pridie, F.R.C.S.

In this subject, recent research has thrown much light on the minute structure, histogenesis, and life history of the disease. But it has made many new difficulties in the matter of treatment and prognosis. It is easy to tabulate the swellings of bones into innocent or malignant tumours and inflammatory affections; but it is quite certain that innocent tumours often become malignant and that conditions which closely resemble osteomyelitis are caused by new growths.

H. Platt<sup>1</sup> gives a very useful summary of the subject. His classification follows that of the Americans and is as follows:—

MALIGNANT BONE TUMOURS—

Primary	{ Sarcoma	{ Osteogenic
		{ Endothelioma (Ewing's)
		{ Extraperiosteal fibroma
{ Myeloma	{ Solitary	
		{ Multiple

*Secondary* (usually carcinomas) to primary growth in breast, thyroid, prostate, kidney, bronchus.

To this might be added to make the list of bone tumours complete:—

INNOCENT TUMOURS OF BONE—

*Bony*.—Exostosis, cancellous or ivory  
*Cartilage*.—Echondroma and enchondroma  
*Cysts*.—Solitary and multiple

In the present review, the innocent tumours will not be separately discussed, but it is of great importance to note that such conditions as chondroma and fibrocystic disease may be confused with malignant growths and also that they may become malignant.

**Primary Bone Sarcoma** is now called an osteogenic sarcoma, and this includes the old periosteal and endosteal sarcoma, but excludes the myeloma, endothelioma, and extraperiosteal fibroma. Statistics show that about 1 in 100,000 of the population of America and 1 in 75,000 in Great Britain are the victims of this disease. It is rather commoner in males than females, and more cases occur between the ages of 10 and 20 than in any other decade. It is nine times commoner in the bones of the lower than the upper limb. Its commonest site of origin is the metaphysis at the lower end of the femur, upper end of the tibia, upper end of the humerus, and lower end of the radius. It is unknown in the bones of the hand or foot. It is composed for the most part of enlarged osteoblasts, i.e., spindle- or oat-shaped cells, a few giant cells being generally found. It involves both the cortex and medulla and is always associated with some osteolytic process, although there is often some osteogenesis of new bone on the surface.

More than half the cases are preceded by some definite trauma, and it is probable that such trauma begins the series of tissue changes which eventuates in a sarcoma. But from a medico-legal point of view this matter is one of controversy. The most constant symptom is *pain*, which begins early, increases with the progress of the disease, and is worse at night. The actual tumour varies very much according to the stage of the disease. In its full-blown manifestation it is unmistakable, forming a spindle-shaped mass of great hardness with the bone as its centre. But it is of vital importance to recognize the tumour in its early stage, when it forms nothing but a slight eccentrically placed prominence on one side of the bone. When the bony mass has grown to be a large tumour the skin over it is pale but shows dilated veins.

In the late stage of the disease there is cachexia with pulmonary symptoms caused by metastases in the lungs and the tumour mass may burst through the skin with fungation, sepsis, or hæmorrhage. It is usual to represent the X-ray picture of bone sarcoma in its advanced stage with sun-ray spicules of bone sticking out all over its surface. Actually the so-called typical sun-ray picture is only seen in about 20 per cent of all cases. When it has reached this stage, the X-ray is unnecessary for diagnosis. In the early stage there is no X-ray appearance which is certainly characteristic of the disease. A little destruction of the cancellous tissue, a little attenuation of the cortex,

or a little nodular thickening, and that is all (*Plate VII*). It takes a bold man to make a diagnosis at this stage, and in fact such early diagnosis is quite exceptional.

J. Ewing<sup>2</sup> is very emphatic about the importance and the difficulty of early diagnosis. He says that any case of constant or increasing localized pain in a bone, of unexplained origin, should be regarded as a sarcoma, and treated without delay by radiation. The diagnosis has to be made from pyogenic osteitis, syphilis, myeloma, or cyst. The inflammatory condition of osteomyelitis is much more likely to be confused with Ewing's tumour and will be referred to in that connection. Syphilis must be excluded by the history, the Wassermann reaction, and by the therapeutic test. Neither myeloma nor cyst is likely to cause symptoms which call for investigation before a characteristic trabeculation or cavity has been formed which can be easily seen in the X-rays.

The pros and cons of biopsy form a most controversial chapter in clinical pathology. It is not easy to make a certain diagnosis of malignant sarcoma of bone even if the whole specimen is available for a complete section. A bit taken for examination may or may not be typical of the whole. A smear of cells or a hollow needle full of tissue may or may not represent the true picture. For most of us it will be enough to learn that the greatest living authority on bone neoplasms—Dr. Ewing—is most emphatic in condemning biopsy. He holds that it should only be the final act in diagnosis to be done by the surgeon as a preliminary step to operative exposure or removal.

**TREATMENT.**—In the matter of treatment, opinion has now definitely swung round to advising *amputation* or *excision* in all possible cases. The high rate of ultimate mortality due to metastatic growths had led many men to advise against amputation, relying on radiation or toxins as the sole method of treatment. Fortunately we now have an exact and far-reaching register of all these cases in the Sarcoma Register of the American College of Surgeons. This puts the matter beyond all doubt. In the last ten years there have been 504 cases. Of these, there are 74 cases alive and well more than five years after treatment. Of these, 39 were treated by operation alone, whilst 35 were treated by operation followed by radiation and/or Coley's fluid. There are no instances of five-year cures in cases treated by radiation alone. Thus early removal of the affected limb is still by far the most effective method of treatment. It should be followed by a course of deep X-ray treatment, applied locally and to the chest, and this should be repeated at intervals of six to twelve months for three years.

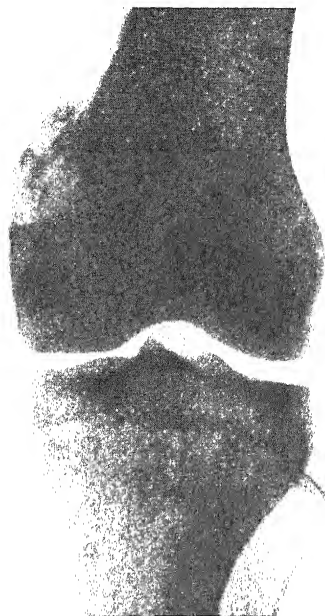
The value of pre-operative radiation is much open to dispute. J. C. Bloodgood<sup>3</sup> advocates this method very strongly and shows cases in which even osteogenic sarcomata almost disappeared by its use (*Plates VIII, IX*). But, as Ewing points out, there are two drawbacks to beginning treatment with radiation: (1) It involves long delay of the operation, probably some months; and (2) When remarkable improvement takes place, the patient will naturally be inclined to plead for abandoning the idea of a mutilating operation. Quite apart from curing the disease, there can be no doubt that both deep radiation and Coley's fluid do cause recession of the growth and alleviation of symptoms. Both these methods, however, produce their best results in Ewing's tumour, which will now be considered.

**Ewing's Sarcoma**, endothelioma, or endothelial myeloma, in point of numbers represents only about 10 per cent of malignant bone sarcomas. Probably, however, it is commoner than is supposed, being mistaken for osteomyelitis. It begins as a painful affection of the diaphysis, the tibia, fibula, humerus, and femur being the bones most commonly affected in the order named. W. C.

## *PLATE VII*

### OSTEOGENIC SARCOMA

(HARRY PLATT)



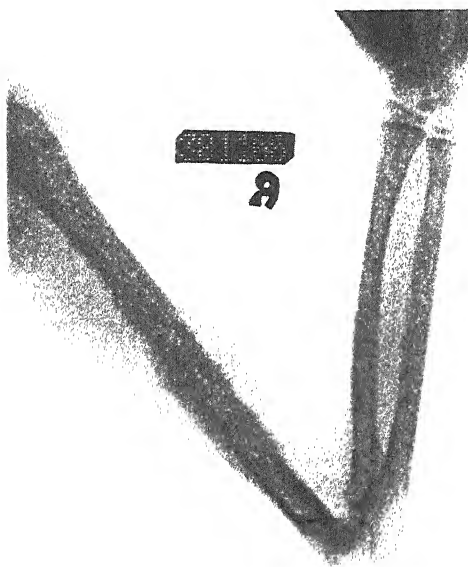
Early osteogenic sarcoma of lower end of femur in a man of 25. The radiograph shows a localized area of destruction in the inner condyle and an attenuated cortex.

*By kind permission of the 'Liverpool Medical-Chirurgical Journal'*

PLATE VIII

PRE-OPERATIVE IRRADIATION IN BONE TUMOURS

(J. C. BLOODGOOD)



X-ray taken on Aug. 1, 1933, before irradiation. It shows soft-part swelling, periosteal bone formation, and changes in marrow cavity. For effect of irradiation, see *Plate IX*.

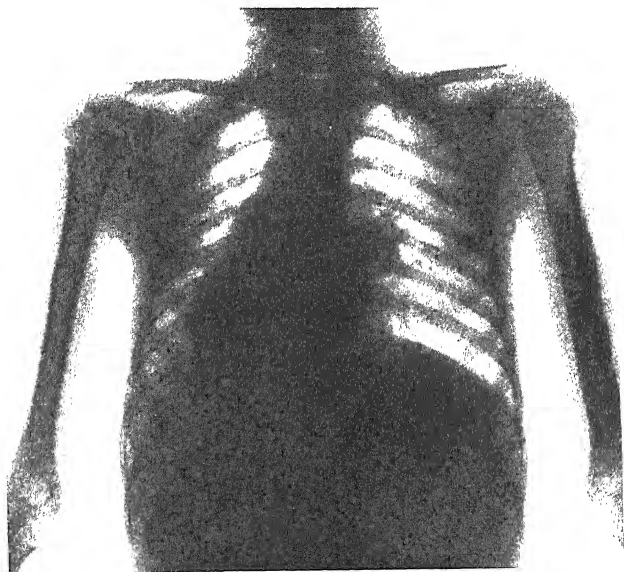
*By kind permission of the 'American Journal of Surgery'*



## PLATE IX

### PRE-OPERATIVE IRRADIATION IN BONE TUMOURS—*contd.*

(J. C. BLOODGOOD)



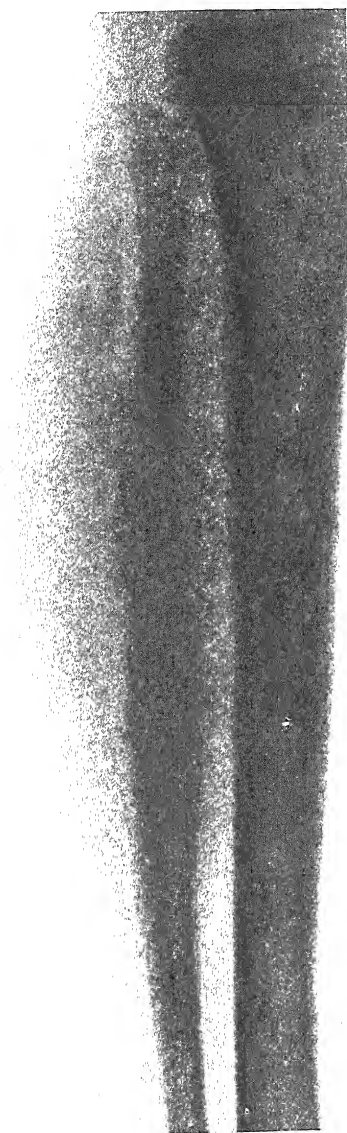
X-ray of same case as *Plate VIII*, taken on April 21, 1931, after irradiation. All soft-part swelling, pain, and tenderness have gone. The child is clinically well. Some weeks later there were signs of metastasis to the chest and skull. No recurrence in the arm.

*By kind permission of 'The American Journal of Surgery'*



# PLATE X—EWING'S SARCOMA

(HARRY PLATT)



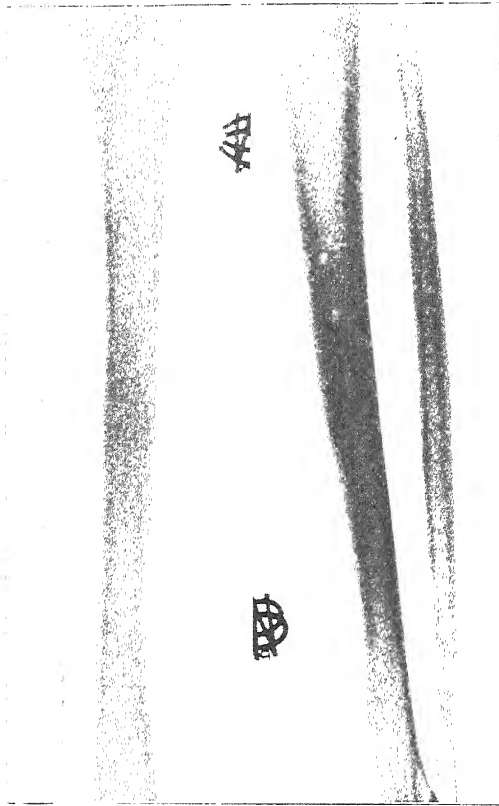
Ewing's sarcoma of shaft of fibula in a female child aged 9. Radiograph shows subperiosteal new bone formation: (1) In lines parallel to the shaft: (2) In lines at right angles to the shaft. The patient died fourteen months after amputation with signs of metastases in the lungs, lymph glands, and other parts of the skeleton.

*By kind permission of the 'Liverpool Medico-Chirurgical Journal'*

PLATE XI

EWING'S SARCOMA—continued

W. C. CAMPBELL



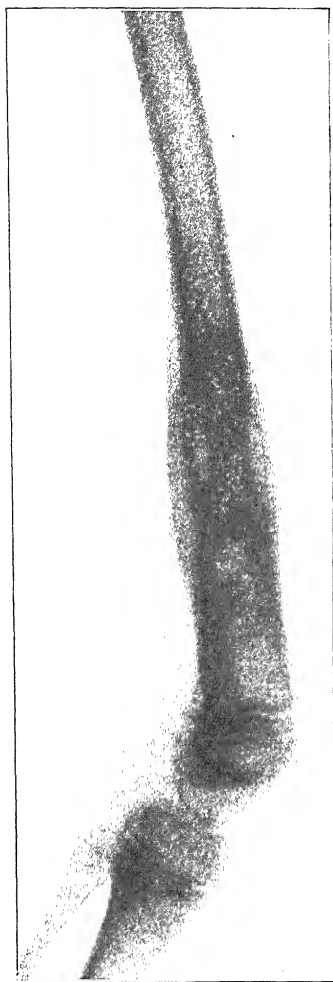
Male, aged 21. First stage of Ewing's tumour, showing only osseous condensation.  
Drill holes of operation for osteomyelitis four months previously.

*Plates XI-XIII by kind permission of the  
'Journal of Bone and Joint Surgery'*

*PLATE XII*

EWING'S SARCOMA—*continued*

(W. C. CAMPBELL)



Boy, aged 6. Typical Ewing's tumour in second stage, with characteristic expansion, striation, and onion-peel reaction of periosteum.

*PLATE XIII*

EWING'S SARCOMA—*continued*

(W. C. CAMPBELL)



Ewing's tumour of the upper end of the femur with pathological fracture and change closely resembling osteomyelitis.

Campbell<sup>4</sup> gives the order of frequency as being tibia, femur, humerus, and fibula. The shaft of the bone becomes thickened with a marked periosteal reaction (*Plate X*). Campbell has shown that if the case is observed from the first, there are three distinct stages in the X-ray appearance of the diseased bone: (1) It appears condensed without any other change (*Plate XI*); (2) The periosteum over it shows reactive irritation with the onion-skin layers typical of osteomyelitis (*Plate XII*); and (3) There is the stage of gross tumour formation with destruction of the original bone structure (*Plate XIII*). In the early stage of the disease when the pain is most acute, there is often a rise of temperature, although this is generally lower than that associated with pyogenic osteomyelitis. The blood picture, too, should distinguish it from the latter disease. Leucocytosis is only of moderate degree, usually about 10,000 cells per c.mm., as compared with 20,000 to 30,000 in osteomyelitis. If operation is done in early stages, a fluid like pus escapes from under the periosteum and on drilling the medulla, but a smear of these will show a conspicuous absence of staphylococci. Microscopically the tumour consists of small round endothelial cells arranged in groups or clumps, and until recently it was described as a 'round-celled sarcoma'.

The rapid shrinkage of the tumour and the amelioration of the pain which follows deep X-ray irradiation is so marked and so constant as to afford a convincing therapeutic test which is less liable to danger and mistake than biopsy.

**TREATMENT.**—The history of the treatment of this tumour has been one of extravagant hope and bitter disappointment. Its rapid response to *radiation*, whether by radium or deep X rays, led to the belief that a cure might be expected from this method. But in every recorded case where radiation has been the sole method of treatment, death from metastasis has occurred within a year or two. W. B. Coley<sup>5</sup> has collected very remarkable and striking figures relating to the results of different types of treatment. These may be thus summarized:—

NO. OF CASES	TREATMENT	NO. OF 5-YEAR CURES	PER CENT
8	Radiation alone .. .. .	0	0
13	Amputation + radiation .. .. .	3	23
24	Amputation alone .. .. .	4	16.6
1	Coley's toxins .. .. .	0	0
12	Amputation + Coley .. .. .	7	58.3
32	Amputation + Coley + irradiation ..	12	37

Some of the most remarkable cures on record are contained in this last group, where amputation was done rather as a palliative measure than with any hope of cure. Metastases, both pulmonary and osseous, had occurred, but yielded before the combination of Coley's toxins and radiation, and the patients are now alive and well at periods varying from five to twenty-six years after.

**Fibro-sarcoma** is really a fibroid tumour growing from the superficial layer of the periosteum. It used to be called a 'parosteal sarcoma'. It is certainly of very rare occurrence. It forms a firm, slow-growing tumour intimately attached to the bone and therefore readily mistaken for a sarcoma. But in its early stages it is painless, and even when of large size it is proved by X-rays to be a growth of the soft parts which throws no bony shadow, though it may cause some absorption by pressure. Treatment should be by local excision.

**Secondary Malignant Tumours of Bone.**—The common type of bone growth secondary to primary cancer elsewhere needs no special description. Curative treatment is out of the question, but *deep radiation* will often give relief from pain. But in exceptional cases the bone growth may occur before there is any suspicion of malignant disease elsewhere. The bone growth may form an obvious solitary tumour in the shaft of one of the long bones, the upper end of the femur being a common site. Or there may be no tumour, and the first evidence of disease may be afforded by 'spontaneous fracture'. This type of solitary bone metastasis causing tumour or fracture is generally secondary to carcinoma of the thyroid, prostate, breast, bronchus, or kidney.

In such cases a biopsy will be of great value as indicating the nature and origin of the disease (*Plate XII, Fig. B*). Unfortunately these osseous metastatic growths usually occur in the proximal parts of the limbs (*Plate XII, Fig. A*) and therefore removal would involve disarticulation of the hip or fore-quartering of the arm, and this would not be justifiable as a palliative operation. Fortunately such growths are not very painful.

Although, at the moment, the American nomenclature and classification of bone tumours has been generally accepted in this country, it is a matter of opinion whether it really represents any advance in our knowledge. Certainly it has been right in abolishing the distinction between periosteal and endosteal sarcoma. But grouping together all these under the term 'osteogenic sarcoma' and making Ewing's tumour into a separate category is not a helpful classification. It is of interest to follow a different system of classification which presumably represents that which is commonly accepted in Germany. R. Glauner<sup>6</sup> tabulates all cases of primary bone tumour occurring in Munich in the last few years as follows:—

	CASES
Group A.—Innocent tumours .. .. .	10
Group B.—Undifferentiated sarcoma .. .. .	27
Group C.—Differentiated sarcoma .. .. .	22
Group D.—Cysts, solitary or multiple .. .. .	14

**Group A.**—These included chondromata, osteomata, and one fibroma. Local removal in all cases was followed by a lasting cure. Two of the cases of chondroma were of special interest. In one a woman of 27 had had loss of sensation in the 'saddle area' with paralysis of the rectum and bladder. The removal of a chondroma from the caudal region was followed by complete recovery. In the other, a man of 22, the upper end of the humerus was the seat of a tumour which encroached on the shoulder-joint. The upper third of the humerus was resected and replaced with a fibular transplant. The tumour proved to be a simple chondroma and recovery was complete.

**Group B.**—The 27 cases of undifferentiated sarcoma included all those cases in which the tumour consisted of spindle or round cells without any mature tissue, e.g., bone, cartilage, or myxomatous tissue. These were treated by amputation followed by intensive X-ray treatment. There were 5 cases of undoubted spindle-celled sarcoma, of which 4 might be regarded as cured, 2 having been alive and well after twelve years. It is noteworthy that several cases of 'mixed-' or spindle-celled sarcoma proved on further investigation to be fibrocystic disease; also that the cases of round-celled sarcoma or Ewing's tumour were at first diagnosed and treated as osteomyelitis.

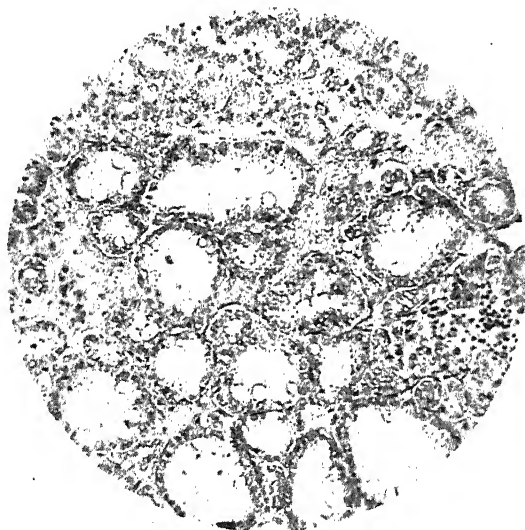
**Group C.**—The 22 cases of differentiated sarcoma, including osteo-, chondro-, and myxo-sarcomata, were treated in the same way as those in *Group B*. The eventual mortality was very little less than that found in the latter group (4 survivals out of 22).



*PLATE XIV*  
SECONDARY MALIGNANT TUMOURS OF BONE  
(HARRY PLATT)



*Fig. A.*—Secondary thyroid tumour in the shaft of the humerus in a woman of 58. The radiograph shows the extent of the tumour nine months from the time of its first discovery. There was no evidence of a primary tumour in the thyroid gland at this date. The patient lived for four and a half years after the diagnosis of the secondary tumour. During that time a thyroid tumour appeared which steadily increased in size, and another small secondary tumour was discovered in the ischium. There was no widespread skeletal dissemination.



*Fig. B.*—Histology of tumour illustrated in *Fig. A*, showing typical thyroid vesicles.

*By kind permission of the 'Liverpool Medico-Chirurgical Journal'*



*Group D.*—Fourteen cases of localized osteitis fibrosa. In this group a difficulty often occurred in making a diagnosis from spindle-celled sarcoma or from the giant-celled myeloma or 'brown' tumour, the characteristic tissue of which is often found in the tissue lining solitary cysts.

In pointing out that radical removal should once more be regarded as the first line of treatment for malignant bone tumours, it is encouraging to note that by the adoption of modern methods of preventing shock, i.e., nerve-blocking and blood transfusion, G. Gordon-Taylor<sup>7</sup> has had success in the hind-quarter amputation, or as he calls it the 'interinnomino-abdominal amputation'. (See also AMPUTATIONS.)

REFERENCES.—<sup>1</sup>*Liverpool Med.-Chir. Jour.* 1935, xliii, 42; <sup>2</sup>*Amer. Jour. Surg.* 1935, xxvii, Jan., 26; <sup>3</sup>*Ibid.* 35; <sup>4</sup>*Jour. Bone and Joint Surg.* 1934, xvi, Oct., 761; <sup>5</sup>*Amer. Jour. Surg.* 1935, xxvii, Jan., 7; <sup>6</sup>*Arch. f. klin. Chir.* 1934, clxxix, Aug., 672; <sup>7</sup>*Brit. Jour. Surg.* 1935, xxii, April, 671.

**BRAIN.** (See also INTRACRANIAL TUMOURS.)

**BRAIN, ABSCESS OF.** (See also EAR, AFFECTIONS OF—INTRACRANIAL COMPLICATIONS.)

*Geoffrey Jefferson, M.S., F.R.C.S.*

There are few subjects of more general interest than that of brain abscess, for no method of treatment so far advised is applicable to all varieties and all situations. First of all diagnosis is often difficult, but, as H. Cairns and C. Donald<sup>1</sup> point out in an important paper, the primary requisite is a careful examination of the cases by a skilled neurologist, who might be a physician or a surgeon. Only too often in the case of otitic abscesses the otologist has a shrewd suspicion that the patient has a cerebral abscess, basing his opinion on general clinical acumen and past experience, but to a very considerable degree on the appearance of the dura mater as observed at operation. It would be wrong to say that this last point was of no importance whatever; there is equally no doubt that it has attained a diagnostic status to which it is not entitled. Nothing will take the place of clinical observation; we must insist upon it as the only valid standard of diagnosis. Even with the most skilful diagnosis and treatment the acute fulminating intracranial suppurations cause death, and it is becoming more and more generally recognized that when possible, operation on the abscess ought to be deferred until it has become encapsulated.

A. W. Adson and W. McK. Craig<sup>2</sup> emphasize three stages of the development of a cerebral abscess: (1) Initial stage of localized meningitis and encephalitis with spontaneous recovery, or progressing to the second stage; (2) A quiescent stage with encapsulation and liquefaction; (3) The terminal stage with recovery through operation, or death. Occasionally recovery from the third stage may occur spontaneously, but more often there is rupture of the abscess into the ventricle or subarachnoid space. They hold, and most surgeons will agree with them, that operation during the second stage is the correct time. It is believed that the wall of an abscess requires from two to three weeks before it becomes firm enough to ensure loculation. There is little doubt that intracranial abscesses have often been present much longer than the history at first obtained suggests, and often enough a patient will have a radical mastoid operation done because of an increase of pain and discomfort which he believes is due to the lighting up of trouble in his ear, but which is really due to the development of an intracranial abscess. When the abscess finally presents unequivocal signs the otologist is apt to assume that it has formed since the radical mastoid operation which he has recently performed.

**How are these Abscesses Best Dealt with?**—Adson and McK. Craig describe the method now employed at the Mayo Clinic. It consists in the exposure of the abscess by an opening in the skull directly over it, excision of a small piece of overlying cortex (after causing the dura to adhere to the brain by electrocoagulation), incision of the wall of the abscess under vision, and packing the cavity with thin gauze strips, which are left in position until their removal on the tenth day. Two rubber catheters are placed in the wound at the time of operation and one at least is left in for six weeks.

J. E. J. King<sup>3</sup> describes in great detail one single case in which he excised the abscess cavity wall after sucking away the necrotic brain tissue around it. Cairns and Donald described the complete excision of one case of chronic cerebral abscess. There is no doubt that this is the ideal method of treatment for an encapsulated abscess near the surface, and sufficiently well defined to allow of this procedure, and several cases have now been reported by different surgeons in which an abscess has in this way been extirpated *in toto* without rupture. The chronic and relatively thick-walled abscess cavity does not drain well. One has a temporary good result, but the abscess fills up again and the cerebral tissue seems to be unable to obliterate and dispose of the capsule. In the intermediate cases, and where extirpation is felt to be impossible, straightforward drainage will often suffice, but the thicker its wall the less likely is this to be the case, and repeated operations may have to be undertaken, each one with decreasing success. Cone, of Montreal, appears to have had some recoveries by applying the King method of sucking out as far as possible the oedematous and infected tissue of the acute abscesses when they are inadvertently or compulsorily operated upon before proper encapsulation has occurred, the cavity being then lightly packed.

REFERENCES.—<sup>1</sup>*Proc. Roy. Soc. Med.* (Sect. Otol.), 1934, xxvii, 1643; <sup>2</sup>*Ann. of Surg.* 1935, ci. 7; <sup>3</sup>*Ibid.* 190.

## BRAIN, METASTATIC TUMOURS OF.

*Macdonald Critchley, M.D., F.R.C.P.*

The question of secondary carcinoma of the brain has recently been reviewed by J. St. C. Elkington.<sup>1</sup> He shows that the published statistics dealing with large numbers of cerebral tumours of all types give very varying figures as to the percentage of metastatic growths. Naturally, the neurological hospitals show an undue proportion of non-carcinomatous tumours, and better information is to be sought from figures from general hospitals. H. Garland and Armitage<sup>2</sup> found 12·8 per cent to be metastatic out of a total of 264 verified cases of brain tumour. Elkington believes that metastatic tumours actually constitute not less than 20 per cent of all cases of cerebral tumour. How many cases of malignant disease eventually show secondary deposits within the brain is uncertain: Krasting<sup>3</sup> puts the figure at 4·7 per cent, and Raw<sup>4</sup> at 3·2 per cent. When bronchial carcinoma is considered, however, the proportion rises considerably—the percentage being estimated at about 30. It is agreed that sarcomata are more prone than carcinomata to metastasize within the brain, and it has been stated that 50 per cent of all cases of melanotic sarcoma develop secondary cerebral growths. When the origin of the primary carcinomatous growth is considered in relation to cerebral metastases, it is found that the bronchus is the commonest site. Thus, out of 72 cases of secondary malignant growths of the brain admitted to the National Hospital, Queen Square, the bronchus was the primary focus in 24 cases, or 33·3 per cent; in Meagher and Eisenhardt's<sup>5</sup> series of 40 cases the proportion of bronchial carcinoma was 35 per cent. Nine out of Elkington's 17 cases (i.e., 52·9 per cent) originated in a bronchus.

Of Elkington's 17 cases, 13 were aged between 40 and 60 years; this age incidence corresponds with the commonest age period for cerebral tumours of all types. The average duration of symptoms prior to the patients coming under observation was 4 months; this length of history is shorter than is usual in other types of cerebral tumour. The average duration of life from the onset of symptoms was 6.3 months; the longest interval was 14 months, and the shortest 3 months. An abrupt onset, with an epileptic fit, a sudden headache or paralysis, was noted in 7 out of the 17 cases. Differentiation has to be made in such cases from cerebrovascular disease.

The commonest symptom is headache, which may be intense and often paroxysmal. The pain is not necessarily due entirely to high intracranial tension. Vomiting is not usually a prominent symptom. Elkington found conspicuous mental changes in 3 cases only; this contrasts rather with the observations of Siefert,<sup>6</sup> W. E. Rees and F. R. Ferguson,<sup>7</sup> and others. Siefert, indeed, had described a delirious state which he regarded as characteristic of carcinomatosis of the brain. Epileptic disturbances of various types occurred in 7 out of Elkington's 17 cases. Evidences of meningeal irritation, such as Kernig's sign and rigidity of the neck, were observed in one case only, although other writers have suggested that these features were common in metastatic tumours. Pupilledema was absent in 9 out of the 17 cases, whilst one patient developed this sign when under observation. Although Rees and Ferguson found pyrexia a common symptom in their series, it was present in 2 only of Elkington's cases.

Cerebrospinal fluid changes may, of course, be detected, the most striking being the presence of malignant cells in the fluid. This was not encountered in any of Elkington's cases.

In two cases (out of a total of 13) an X-ray of the skull revealed an alteration in the cranial wall corresponding with a malignant deposit. Skiagraphy of the chest is, of course, a most important diagnostic feature in the case of primary bronchial carcinoma.

Elkington regards as features of importance in suggesting a metastatic type of growth: (1) Short history; (2) An elderly subject; (3) Sudden onset of symptoms; (4) General failure of health out of proportion to the nervous disorder; (5) Severe headache without other signs of intense intracranial pressure; (6) Symptoms or signs suggesting disease elsewhere—especially the lungs.

As regards treatment, the writer suggests that when headache is severe, *decompression* should be performed over the site of the tumour.

E. Oldberg<sup>8</sup> has also suggested that operation should not be withheld from patients with suspected metastases in the brain, provided that the general condition warrants it, and that the cerebral tumour is apparently solitary. Three reasons for surgical intervention are given: (1) It may be possible to remove the metastasis, with relief to the patient and prolongation of life; (2) If the lesion cannot be removed, at least palliative decompression can relieve some of the more distressing symptoms; and (3) Occasionally a gratifying surprise is encountered, in the form of a benign type of tumour.

Elkington's findings may usefully be compared and contrasted with an earlier paper by J. H. Globus and H. Selinsky.<sup>9</sup> Their series comprised 12 cases with complete post-mortem studies. The authors put forward the following clinical picture as characteristic of metastatic tumours of the brain: (1) An acute and often precipitate onset of cerebral symptoms, commonly of a disjointed or disseminate character, simulating a meningo-encephalitic process; (2) Symptoms of increased intracranial pressure, such as headache, nausea, vomiting, and dizziness, out of proportion to the objective neurological findings;

(3) Papilloedema rarely; (4) Meningeal signs not infrequently, often associated with radicular pain; (5) A rapidly declining clinical course, with the progressive appearance of new and poorly linked or diffuse signs, and by general wasting and growing asthenia; (6) Terminal psychotic manifestations at times. Globus and Selinsky do not regard these last as of diagnostic value beyond indicating a widespread cellular reaction.

REFERENCES.—<sup>1</sup>*Proc. Roy. Soc. Med.* 1935, xxviii, 1080; <sup>2</sup>*Jour. Pathol. and Bacteriol.* 1933, xxxvii, 461; <sup>3</sup>*Zeits. f. Krebsforsch.* 1906, iv, 315; <sup>4</sup>*Ibid.* 1922, xviii, 141; <sup>5</sup>*Ann. of Surg.* 1931, xciii, 132; <sup>6</sup>*Arch. f. Psychiat.* 1902-3, xxxvi, 720; <sup>7</sup>*Lancet*, 1930, i, 738; <sup>8</sup>*Jour. Amer. Med. Assoc.* 1933, ci, Nov. 4, 1458; <sup>9</sup>*Arch. Neurol. and Psychiat.* 1927, xvii, 481.

## BREAST, DISEASES OF.

W. Sampson Handley, M.S., F.R.C.S.

### PHYSIOLOGICAL FACTORS IN BREAST PATHOLOGY.

**Hormonic Regulation of Mammary Activity.**—The activities of the breast have a monthly cycle which indicates their dependence on ovarian function, and this in turn is regulated by the anterior pituitary. At puberty the breasts enlarge, and before each period there is hyperæmia with corresponding lymph-congestion, indicated by tenderness and swelling. These symptoms subside rather suddenly with the onset of the period. Histologically there is premenstrual proliferation of the alveoli and activity of the epithelium. The tendency of the moment is to ascribe all troubles of the breast to endocrine dysfunction. It is essential to notice, what some authors have forgotten, that hormonal disturbance cannot be the sole cause of troubles of the breast which are local and unilateral. Duct obstruction and irritation by retained secretion are certainly important factors in conditions such as chronic mastitis or papillomatosis which are known to affect individual lobes of the breast while sparing others. Duct infection is a frequent cause of duct obstruction, and in this connection the great frequency of *Demodex* infection of the nipple must be remembered.

**The Breast and Menstruation.**—E. K. Dawson<sup>1</sup> discusses the histological changes seen in the normal mamma in relation to age and to menstrual function. Rosenberg stated that in the menstrual interval lobules are not found—only milk ducts in a dense stroma; he considered that lobules are re-formed in the pre-menstruum, and after the period again involute and disappear. Dieckmann finds that the lobule is a gradual growth of many years and that it persists through the menstrual interval. Menstrual changes, according to him, are associated with a temporary physiological œdema around the lobule, and not with epithelial activity. After the period the œdema disappears. Dawson's observations, and my own too, agree with Dieckmann's descriptions and contradict those of Rosenberg. Dawson found lobules still existing many years after the menopause.

The abnormal persistence of the pre-menstrual lymph congestion of the breast, owing to conditions of local lymphatic obstruction, is in my view the cause of chronic mastitis.

**Oestrin and the Breast.**—Dean Lewis and C. F. Geschickter,<sup>2</sup> by injecting 2000 to 5000 rat-units of oestrin into the breasts of male monkeys over a period of some weeks, produced bilateral hypertrophy of the breasts. The histological changes resembled those of gynæcomastia—proliferation of the ducts, increase in the periductal fibrous tissue, and the presence of an epithelial lining of two or more rows of cells. They refer to the statements of Kriss and others that teratoma and chorionepithelioma of the testicle are associated with gynæcomastia. Both tumours may contain chorionic tissue, and may thus be a source

of œstrin. Œstrin has been recovered from the tissues of patients with tumours of the testicle.

In four male monkeys injections of anterior-pituitary-like hormone (follutein) obtained from pregnancy urine produced less definite hypertrophy of the breasts, associated with enlargement of the testicles and of the prostate.

The hypertrophy of the breasts which occurs in females before the onset of menstruation is stated to resemble gynæcomastia in its causation and in its histology. Lewis and Geschickter believe that fibro-adenoma is a 'localized' response to the same stimulus which, acting on the whole breast, produces virginal hypertrophy.

In one specimen of fibro-adenoma a high concentration of œstrin was found on analysis. The authors conclude that gynæcomastia, virginal hypertrophy, and fibro-adenoma represent different phases of the same pathological process, and may have the same etiological factor—œstrin. It is, however, rather difficult to see how such a biochemical factor can determine unilateral gynæcomastia or initiate a local fibro-adenoma. Pickhardt, in the discussion which followed, stressed—rightly in my opinion—the importance of mechanical duct-stasis, and of inflammation due to chemical irritation by retained secretions, as factors in breast pathology. Even more important, as laying the foundations of local lymph obstruction in particular lobes, are the casual infections of the ducts which must so often occur.

#### CHRONIC MASTITIS.

**Chronic Cystic Mastitis and Carcinoma.**—P. Klingenstein<sup>3</sup> discusses cystic disease of the breast (Réclus' disease) with particular reference to the question whether it tends to end in carcinoma. Brodie, Schimmelbusch (who found coincident carcinoma in 3 out of 43 cases), von Saar, and Bertels, believed that it does, and in my opinion they are right. Tietze is quoted as estimating that 10 per cent of cases of cystic mastitis develop carcinoma, Speese 15 per cent, Semb 24 per cent, Cheate and Cutler 20 per cent. Of breasts removed for undoubted carcinoma, MacCarty and Keynes found cystic changes in 80 per cent, Thompson in 33 per cent, W. Fischer in 14 per cent, Ewing in 50 per cent.

In spite of the evidence he quotes, Klingenstein does not consider that mastectomy is necessary for cystic mastitis, but thinks that partial resection suffices, a view difficult to reconcile with Greenough and Simmonds' statistics. They found in 83 cases of cystic disease treated by partial operation that cancer developed subsequently in 4 cases. The follow-up period is not stated, but the remaining 79 cases remain at risk, and only a lifelong follow-up could establish the real facts. Klingenstein in 54 cases treated by partial operation and followed up found 3.8 per cent of subsequent carcinoma. Semb, who usually practises complete mastectomy for cystic disease, observed 2 cases of carcinoma following partial resection for this condition. Bloodgood found only 3 instances of cancer following 128 partial resections for cystic disease, and considers that any group of women of like age would show a like incidence.

Perhaps I may take Klingenstein's paper as an excuse for stating my own views on cystic disease of the breast. They are inferences from my views on its pathology.

Chronic mastitis is a fibrosis of the breast due to persistent lymph-stasis, and in such cases, if there is even partial obstruction of the ducts, or if the tissue pressure becomes really high, cystic distension of the ducts and acini is a natural consequence of the abnormal pressure of the tissue fluid. Lymph-stasis stimulates the proliferation of epithelium just as powerfully as it encourages the formation of fibrous tissue, but the effect is a slower one. Hence the epithelium of many cysts undergoes pressure atrophy before the stimulus is felt,

while in others papillomata are ultimately formed which tend in the course of years to become carcinomatous. The complete cycle of changes from permanent lymph-stasis to malignancy may be estimated to occupy twenty years. (*Plates XV, XVI.*)

Now for the practical inferences. Up to the age of forty cystic mastitis may be treated merely by three half-pastel doses of 180,000-volt X rays to depress the activity of the epithelium, provided that the breast is seen by a skilled observer once in three months. Even up to the age of fifty, if close observation can be ensured, a similar policy is justifiable in the absence of duct-retraction, deviation of the nipple, serous discharge, or of more definite signs of carcinoma. It should not be forgotten that mastectomy is an insult to physical pride which may have serious psychological reactions. The X-ray course may be repeated every two years.

After the age of fifty a cystic breast should be removed. A single cyst, near the nipple, may be tapped and injected with 10 min. of 5 per cent protargol, but, broadly speaking, a breast which has produced more than one cyst should be removed in a patient over fifty. If physical pride is an important factor and if the cysts are confined strictly to one segment of the breast, usually the upper and outer quadrant, this quadrant may be resected through a marginal incision and a course of X rays given. The breasts must be subsequently watched.

**Experimental Cystic Mastitis.**—Sir Lenthal Cheate<sup>4</sup> describes experiments by Lacassagne on young male mice. A course of oestrin injections produced in some weeks an epithelial hypertrophy and cystic changes in the ducts of the breasts, terminating in carcinoma. Metastases in the lungs were found in some cases. Cheate considers that the changes produced (among which, however, judging from the illustrations given, cyst-formation is not prominent) are identical with those seen in Schimmelbusch's disease, or chronic cystic mastitis. He finds in them confirmation of his belief that chronic mastitis, which he calls 'mazoplasia', is a condition quite distinct from chronic cystic mastitis, which he calls 'desquamative cystiphorous hyperplasia'. According to him the former condition never leads to cancer. He advocates mastectomy for all cases of chronic cystic mastitis. Some of the breasts removed by him have proved to be only cystic, others have contained cysts with papillomatous growths, others unsuspected early carcinoma. He has met with instances in which local excision of a cyst or cysts has been followed by carcinoma. He considers it would be unwise, in view of Lacassagne's experiments, to administer 'ovarian residue' to women with cystic breasts, but does not think harm can be done by it in mazoplasia.

**Chronic Non-cystic Mastitis (Mazoplasia).**—I am of opinion that Cheate's 'mazoplasia' is only an early stage of his 'desquamative cystiphorous hyperplasia'. The two conditions may sometimes be seen in the same field of the microscope. There seems no need to abandon the old terms 'chronic mastitis' and 'chronic cystic mastitis'.

In an article on the prognosis of non-malignant diseases of the breast, Pearce Gould<sup>5</sup> supports Cheate's conclusions, and states, regarding chronic mastitis, that the condition, by whatever name it is called, is never a pre-cancerous one.

I can only record my conviction that chronic mastitis and chronic cystic mastitis are stages of the same process, which begins with persistent lymph-stasis and not infrequently ends in carcinoma. The process is, however, such a slow one, extending perhaps over twenty years, that clinical evidence is hard to secure, but the case recorded later in this article is not unique. I have dealt with the subject more fully elsewhere.<sup>6</sup>

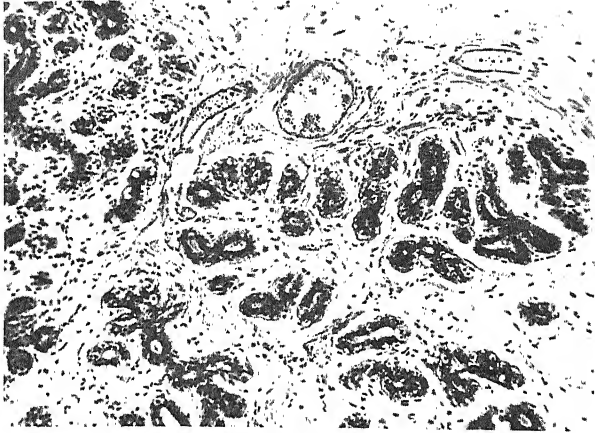
In my opinion every case of non-cystic chronic mastitis in a woman over



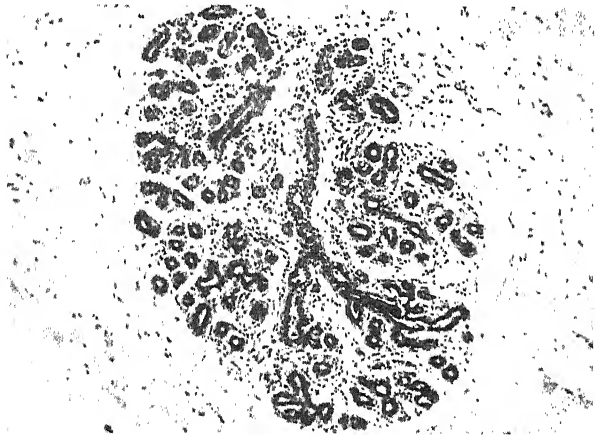
## PLATE XV

### THE STAGES OF CHRONIC MASTITIS

(W. SAMPSON HANDLEY)



*Fig. A.*—Chronic mastitis in the initial stage of lymphatic congestion or lymph-stasis which precedes the stage of intralobular fibrosis. The acini are practically normal, though some of them show slight cystic distension. They are surrounded by a system of empty spaces, in places lined by definite endothelium. The system represents the lymphatic vessels and spaces of the lobule distended by lymph. The blood-vessels are also congested. The epithelium shows no change. ( $\times 105$ .)

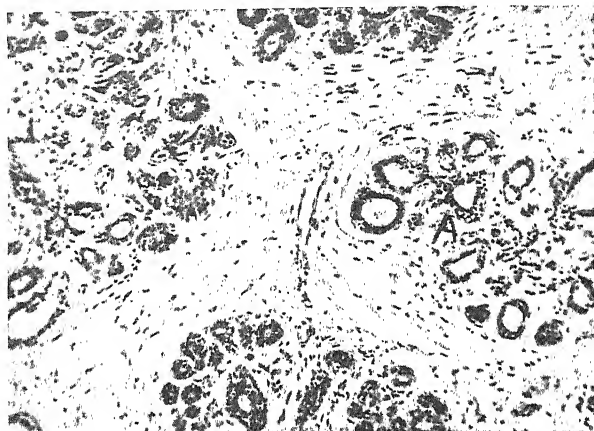


*Fig. B.*—Chronic mastitis, stage of early intralobular fibrosis. Another part of the breast from the same case as the preceding figure. Intralobular fibrosis has now begun. A few empty lymph vessels or spaces can still be seen, and the perilobular lymph space is distended by lymph, but most of the distended lymph vessels and spaces have become obliterated and filled up with young fibrous tissue resulting from the proliferative response of the lymphatic endothelium and the fixed connective tissue cells to the stimulus of lymphatic congestion. For the same reason the epithelium of the small duct begins to show proliferative activity. ( $\times 85$ .)

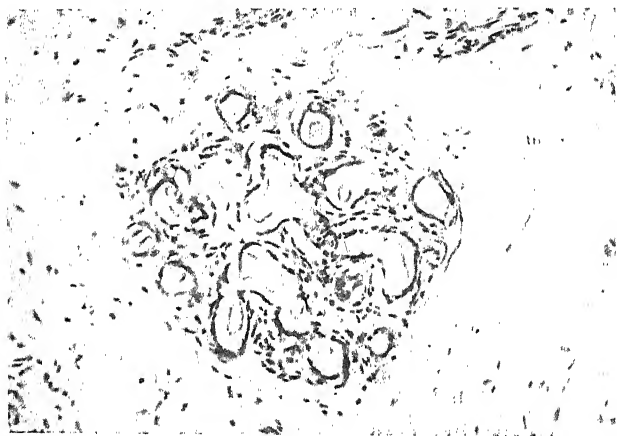
## PLATE XVI

### THE STAGES OF CHRONIC MASTITIS—*continued*

(W. SAMPSON HANDLEY)



*Fig. C.*—Chronic mastitis. More advanced intralobular fibrosis. From the same case as the two preceding figures. The distended lymph spaces and the perilobular lymph sinus have now disappeared, the intralobular fibrous tissue is becoming less cellular and more fibrotic. The acini are dilated, the epithelium is more active and is no longer single layered. Just above A there is a suggestion of incipient malignant infiltration. ( $\times 105$ .)



*Fig. D.*—From a case of 'Röclus' disease (cystic chronic mastitis) in a stage of advanced intralobular fibrosis with obliteration of the perilobular lymph sinus and of the lymphatic vessels and spaces. The acini much dilated and filled with secretion show a tendency to run into each other which may herald malignancy. The inter-acinous fibrous tissue is increased in amount, is of the 'adult' type though still cellular, and is blended closely with the fibrous tissue in which the lobule is embedded. ( $\times 155$ .)

*Plates XV, XVI from the author's 'Genesis of Cancer', Kegan Paul*

forty should receive a short prophylactic course of deep X rays as a sedative to the epithelium, and should subsequently be seen every three months.

**'Mastopathia' (Chronic Interstitial Mastitis).**—F. d'Abreu,<sup>7</sup> in a thoughtful paper on chronic interstitial mastitis, which he prefers to call 'mastopathia', upholds the endocrine origin of the condition, but does not mention the difficulty that it is frequently unilateral, and that if bilateral it often affects only part of the breast, the upper and outer quadrant for choice. He believes that the premenstrual proliferative activity seen in the breast, and called by Cheatele 'mazoplasia', may, if the ovarian function is deficient, fail to undergo the usual post-menstrual involution and then may gradually pass into permanent nodularity of the breast with epithelial hypertrophy and cyst formation (Cheatele's 'cystiphorous hyperplasia'). D'Abreu found nodularity of the breast in 144 out of 500 women examined. "Nearly all of those [with nodularity of the breast] who were between puberty and the menopause showed signs of ovarian hypo-function, their periods being painful and scanty, and were of the asthenic, chronically unhealthy type."

D'Abreu treated 15 cases, 9 of which had had courses of X-ray treatment without benefit, by the administration of *ovarian residue* tablets 5 gr. t.d.s., during the fortnight preceding menstruation, as recommended by Cutler, or by daily injections of *theelin* 2 c.c. (Parke, Davis & Co.), the pure follicular hormone, during the same period. Of these patients, 12 reported a remarkable improvement as regards pain, and there was a noticeable diminution of nodularity; in 3 cases all traces of nodularity had disappeared. In the remaining 3 there was no improvement.

It would appear that a hormone secreted by the developing Graafian follicle is regarded as the pre-menstrual breast stimulant. Accounts differ as to whether lutein stimulates breast activity. In view of d'Abreu's results, Cutler's method deserves a further trial, though personally I have found X-ray treatment more satisfactory, and there is much that is still obscure and contradictory in the accounts given of the endocrine government of the monthly breast-cycle.

#### TUBERCULOSIS OF THE BREAST.

J. L. McGhee and H. C. Schmeisser,<sup>8</sup> of Memphis, contribute a well-documented paper on tuberculosis of the breast, based upon eight cases, seven of which occurred in negro women. They refer to Sir Astley Cooper's pioneer contribution (1829) on "Scrofulous Swelling of the Bosom". Dunbar in 1881 found the tubercle bacillus in the tissues. In all, the authors found about 400 reported cases in the literature. The possible routes of infection are: (1) Through the ducts; (2) Through a surface wound; (3) Through the bloodstream; (4) Through the lymphatics; and (5) Through the contiguity of structures, e.g., from a diseased rib. J. B. Deaver believed that retrograde lymphatic involvement from the axilla or from some intrathoracic focus is the usual route. I would add that tuberculous glands of the neck in childhood frequently lead to enlarged axillary glands which may persist after the neck-glands have disappeared. In such cases the authors point out that axillary gland enlargement precedes the appearance of a lump in the breast. Raw in 1926 considered breast tubercle to be due to the bovine bacillus, as might be expected if the tonsil is the primary port of infection.

The authors rightly state that frequently the mammary disease is the only focus of tubercle demonstrable. Only 81 out of 400 cases occurred in unmarried women, and only 13 per cent of cases gave a family history of tubercle.

The age incidence is important as a help to the diagnosis from carcinoma. The average age of the author's 8 cases was 32, the youngest was 20, and the oldest 46. The mass was fixed in every case, and the overlying skin attached

in 7 cases. *Peau d'orange* was present in 6 cases, retraction of the nipple in 5 cases. Axillary glands were palpable in 7 cases. A sinus was present in 4 cases.

Coincident cancer was present in one case, and it is significant that this was the oldest case. Two of the cases began with an acute abscess. The pre-operative diagnosis was cancer in 6 of the 8 cases. The authors recommend pre-operative radiation followed by cautery-knife excision and post-operative radiation. Six of the 8 cases remained well when last heard of; 1 died of post-operative shock, and 1 of metastatic cancer.

To this summary I would add a few remarks on tubercle of the breast. Mammary tubercle, like all tubercle, is a lymphangitis. It leads to lymphatic obstruction and lymph-stasis and may ultimately thus produce cancer. I am accustomed to teach that it has three stages which simulate respectively (1) chronic mastitis, (2) cancer, (3) chronic or acute abscess. A supposed cancer without axillary gland enlargement occurring under the age of 35 is likely to prove on biopsy to be tubercle. I have found simple mastectomy by the diathermy needle a satisfactory method of treatment if the axillary glands are removed in continuity with the breast. Removal of the pectorals is in my opinion unnecessary, but a short subsequent course of deep X rays is advisable.

#### MALIGNANT DISEASE OF THE BREAST.

**Colloid (Gelatinous) Cancer of the Breast.**—J. Lee, H. Hauser, and G. T. Pack<sup>9</sup> find that colloid cancer of the breast, like colloid cancer of the rectum and stomach, has a low malignancy, growing slowly and metastasizing late. It is rare in the breast—30 cases out of 1922 of breast cancer. The tumour is often encapsulated, and the skin, the nipple, and the fat of the breast may be free from invasion after years of growth, so that the tumour may be erroneously thought to be innocent. This is only true if the whole tumour has undergone the mucoid change.

In Lee's 30 cases of colloid cancer the percentage of five-year cures was 57, as compared with 41 per cent in a control group of 217 cases of ordinary mammary cancer. Only 24 per cent showed retraction of the nipple. Occasionally a colloid cancer ulcerates, discharging a glairy greenish mucinous material. Metastases are usually confined to the axillary lymph nodes, which may themselves show colloid changes. (*Plate XII.*)

**Diffuse Intraductal Carcinoma.**—E. H. Lepper and A. H. Baker<sup>10</sup> describe from the Elizabeth Garrett Anderson Hospital 11 cases of diffuse intraduct carcinoma of the breast, a condition in which the ducts of the breast are extensively distended by malignant epithelium, which here and there may infiltrate the surrounding tissues. The condition probably originates in a diffuse papillomatosis of the ducts. It was called by Ewing 'comedo carcinoma' because of the whitish plugs of degenerate epithelium which are seen on section filling the ducts. The more chronic cases are often associated with Paget's disease of the nipple.

In diffuse duct-carcinoma the single typical lump of ordinary breast cancer is replaced by a diffuse lumpiness which may simulate chronic cystic mastitis. Discharge from the nipple was present in 7 out of 11 cases. It may be blood-stained or serous and in one case was described as purulent. Probably in this case the discharge was a suspension of degenerate epithelium. In 6 cases no glands were palpable, in 3 the glands were hard. The nipple was retracted in 4 cases.

The areas of malignant infiltration around the distended ducts may be small and easy to miss. The authors suggest a hormonal origin for the disease. To

*PLATE XVII*

COLLOID CANCER OF THE BREAST

(J. LEE, H. HAUSER, and G. T. PACK)



Encapsulated multilocular gelatinous carcinoma of the breast. The tumour is intersected by thin fibrous strands to form compartments of variable size.

*By kind permission of 'Surgery, Gynecology and Obstetrics'*

*PLATE XVIII*

DIFFUSE INTRADUCT CARCINOMA OF THE BREAST

(E. H. LEPPER and A. H. BAKER)



Unmagnified section showing diffuse nature of the condition.

*By kind permission of the 'British Journal of Surgery'*

avoid mistaking a malignant condition for an innocent one, it is necessary for both the surgeon and the pathologist to recognize the peculiarities of diffuse duct carcinoma (*Plate XVIII.*)

**Fallacies of Breast Statistics.**—A. Gentile, D. Murphy, and E. Lehman<sup>11</sup> (University of Virginia) draw attention to the fallacies introduced into the statistics of carcinoma of the breast by the inclusion of cases erroneously diagnosed as malignant when they are really innocent. In a series of 63 cases originally diagnosed as cancer of the breast, and completely followed up, 8 (12.5 per cent) were found to be innocent on careful re-examination of the pathological material. The five-year survival rate was thus reduced from 44.4 to 38.1 per cent. Of the 8 innocent cases, 7 were still living five years or more later. This paper is a useful reminder of the fallacies attendant on statistics, and of the vital importance to the surgeon of the trained morbid histologist.

**Prevention of Breast Cancer.**—The most important of all the problems of breast cancer, and perhaps the one which has received the least attention, is how to prevent the disease. How can the fatal progress from simple lymph-stasis to carcinoma be arrested? It is impossible to re-establish the patency of the blocked lymphatic channels, and so to restore the normal environment of the tissues of the breast. But fortunately we can administer to the abnormally stimulated tissues a dose of radiation sufficient to depress without destroying their vitality and proliferative activity.

In the *Practitioner* for April, 1910, the reviewer advocated the X-ray treatment of chronic mastitis. It is frequently followed by disappearance of the mastitic induration and by relief of pain. Only a short course of treatment is required, but the radiation should be of high voltage (180,000). Since the introduction of high voltage X rays, out of some hundreds of cases, I have not observed a single one in which a carcinoma subsequently developed in the radiated breast. It seems a fair inference that we now possess a weapon which, properly employed, is able to prevent breast cancer. The proof can only be supplied by a collective investigation, which should be undertaken by a group of medical women.

**Treatment of Carcinoma.**—G. E. Pfahler and J. H. Vastine,<sup>12</sup> from a large experience, recommend operation, preceded and followed by X-ray treatment, for breast carcinoma. If operation is refused or is impossible, radium by a modified Keynes technique is used and is followed by additional X-ray treatment, "the attempt being made to keep the tissue saturated to the limit of its tolerance for a period of three to four weeks".

Of 19 cases which were treated by interstitial radium, 13 remained free from gross evidence of disease for a period of from fourteen to twenty-seven months. Two were alive a year or longer after the treatment, but showed gross evidence of the disease. Three died of the disease and one of intercurrent disease.

The authors have treated 254 cases of primary carcinoma by irradiation alone, chiefly X-ray therapy. Of 195 patients, 76 (39 per cent) were alive after three years; 11 of these still showed evidence of disease. Of 181 patients followed up for five or more years, 24 per cent were still alive, 4 of them with active disease. Of 124 patients treated for inoperable carcinoma, 25 (20 per cent) were alive and free from disease ten years later.

The authors treated 476 cases of recurrent carcinoma of the breast. Of 453 patients, 21 per cent were free from symptoms at the end of five years, and of 288 patients, 8 per cent were free from symptoms at the end of ten years.

Pfahler and Vastine state that in cases of axillary involvement surgery combined with radiation, as contrasted with surgery alone, yields twice as many five-year cases.

**The Lahey Clinic Results.**—R. H. Overholt and E. B. Eckerson<sup>13</sup> place on record 719 breast cases of all kinds seen at Lahey Clinic, Boston, Mass., between 1923 and 1933. All but 4 of these cases were followed up, a remarkable feat perhaps made possible by the educational campaign of the American Society for the Control of Cancer. Of the 719 cases, 280 cases, mostly of bilateral chronic mastitis, were not operated upon; 238 cases were operated upon and found to have a benign lesion, which in 121 cases was a chronic cystic mastitis. A malignant lesion was found in 201 cases; 17 of these were inoperable and 15 refused treatment. Of the 169 cases operated upon, 4 died following the operation, and 4 were lost sight of.

STATE AT END OF 1933 OF BREAST CANCERS OPERATED  
UPON 1923-33.

Total number of cases	..	..	165	
Living	..	..	89	
Dead of cancer	..	..	56	
Dead of other causes	..	..	20	
Living with metastasis	..	..	20	} (54 per cent of total
Living without metastasis	..	..	69	
Died within two years	..	..	46	
Died of cancer within two years	..	39		{ (70 per cent of those dying of cancer)

FIVE-YEAR RESULTS.

Operated cases, 1923-28	..	..	62	
Living free from cancer five years later	..	..	25	(40 per cent)
Living with metastasis five years later	..	..	5	
Died of cancer after five years	..	..	3	
Died of other causes after five years	..	..	2	

Forty-eight per cent of the cases had axillary involvement (a decidedly lower percentage than is experienced at the Middlesex Hospital—again partly a result of public education). The authors discuss the question of cancer of the second breast, and believe that in cases of bilateral breast cancer it is practically impossible to say whether the tumour in the second breast is a metastasis from the first or a new tumour. On this point the reviewer does not agree with them. If palpable glands in the axilla precede the tumour in the opposite breast, then the tumour is a secondary one. If the lump in the second breast precedes the gland enlargement in that axilla, then the lump is a second primary carcinoma. With the improved results of the primary operation, the danger of a second cancer in the remaining breast acquires increasing importance, and for this reason alone, apart from the risk of recurrence, a six-monthly follow-up, indefinitely prolonged, is imperative, as Overholt and Eckerson insist.

A recent case of the reviewer's may serve to point a moral. A nurse, operated upon seven years ago for carcinoma of the left breast, was advised to have a prophylactic X-ray course for an area of chronic mastitis in the right breast, but refused. The breast became cystic, and its removal was then advised, but this advice also was rejected. Seen again recently after a five-year interval, she had an inoperable carcinoma of the right breast, arising in the mastitic area, without recurrence of the original growth.

The authors conclude their valuable paper by stressing the importance of radiation as an adjunct to operation. In women before the menopause pelvic radiation is used to induce an artificial menopause, and so to check the stimulation of the breast by ovarian hormones.

In regard to early diagnosis, they say that "A lump in the breast which is



malignant should be removed before it is possible to tell clinically what it is". In this connection attention is directed to the danger signals of threatened malignancy which the reviewer described some years ago, namely: (1) Duct-retraction, a recceding of one of the duct-orifices on the nipple, usually associated with a mastitic induration of the corresponding lobe; (2) Deviation of the axis of the nipple; (3) Slight elevation of the nipple is also a warning. These signs indicate the formation of adventitious fibrous tissue in one or more of the lobes of the breast. The fibrous tissue may be due to pre-cancerous periductal fibrosis or may be the stroma of a carcinoma. Overholt and Eckerson found carcinoma in one-third of their cases of sanguineous discharge from the nipple and advise mastectomy for this condition. The reviewer would also advise mastectomy for persistent serous discharge in a patient who has reached the cancer age.

**Radiation in Breast Cancer.**—A. Hintze<sup>14</sup> reports that in a large Berlin clinic 70 per cent of operable cases of breast cancer, and 80 per cent of all cases, including inoperable ones, are fatal within a few years. But if post-operative radiation is used many permanent cures result. Radiation is advocated as a supplement to operation, not as a substitute for it. The heavy dosage necessary if X rays without operation are employed has an effect on the body generally no less severe than that of an operation. Inoperable or recurrent cancer of the breast can best be treated by irradiation. The author does not discuss the relative values of radium and X-radiation, nor draw attention to the superiority of radium in the treatment of many forms of recurrence. Two cases are recorded in which X-ray treatment arrested spinal deposits for periods of two years and ten years respectively. The increasing efficiency of X-ray treatment in controlling bone deposits and relieving pain is illustrated by Hintze's results, and is not yet fully realized by the profession.

**Interstitial Radium in Carcinoma.**—R. G. Hutchison<sup>15</sup> considers that mammary carcinoma does not lend itself to surface radiation by radium, and that interstitial methods must be employed. He describes a method for the interstitial radiation of breast cancer which has been developed at the Manchester Radium Institute of which he is Assistant-Director. He considers it superior to that of Keynes. For details the original paper must be consulted. Hutchison considers that the internal mammary zone, the upper axilla, and the supraclavicular region usually escape adequate radiation. He makes the useful suggestion that  $1\frac{1}{2}$  m.c. radon seeds may with advantage be used for the irradiation of the internal mammary chain of glands. Three of these seeds are inserted at the inner end of each of the first four intercostal spaces, one behind the edge of the sternum, one behind the edge of the upper costal cartilage, and one behind the edge of the lower costal cartilage bounding the space.

**Radiation-castration after Breast Carcinoma.**—Grantley Taylor<sup>16</sup> considers that, now the function of the ovaries can be abolished by pelvic radiation, and in view of the occasional favourable results which followed oophorectomy in the hands of Beatson and Lett, a further trial should be given to radiation-castration in carcinoma of the breast. The proposal does not appear to be a very hopeful one, since Ahlbom, from a careful study of 163 cases sterilized at the Radiumhemmet, concluded that there is no proof that radiation-castration combined with local radiation therapy is more advantageous than local radiation alone. Of his cases, 73 per cent, nearly all of which received local radiation as well, showed improvement, and in no case was any harm done. Grantley Taylor points out that radiation-castration following radical operation would safeguard the patient by eliminating the possibility of a subsequent pregnancy. Trout collected 15 cases of pregnancy subsequent to operation for breast cancer, in 13 of which there was prompt

development of carcinoma of the remaining breast. It seems a fair criticism of the suggested procedure to point out that the natural menopause does not appear in any degree to diminish the incidence of breast carcinoma. Cases such as that of Hoffman, in which scalp nodules disappeared following pelvic radiation, have little evidential value, since the spontaneous disappearance of local nodules has been frequently observed apart from any treatment. To the reviewer the scope of radiation-castration seems restricted to cases in which a subsequent pregnancy, with its evil consequences, is to be feared.

**Sarcoma of the Breast.**—S. L. Fox<sup>17</sup> contributes a study of sarcoma of the breast based upon 60 cases from Johns Hopkins Hospital—1.6 per cent of all the malignant mammary tumours. He groups the sarcomas as follows: (1) Fibro-sarcoma of the fascial type, solid tumours which may undergo cystic degeneration and are often encapsulated. (2) Fibro-sarcoma derived from pre-existing fibro-adenoma, and therefore often containing gland elements; they are often encapsulated. (3) The serocystic sarcoma of Brodie derived from an intracanalicular fibro-adenoma and often producing an enormous tumour. (4) Lymphosarcoma. (5) The author, without producing any convincing evidence, describes 'neurogenic' sarcoma of the breast, including in it melanotic sarcoma and a 'myeloid' form of sarcoma. Seventy per cent of the tumours were fibrosarcomata, 11.7 per cent lymphoid sarcoma. The age incidence ranged from 13 to 75 years and was roughly the same as the incidence of carcinoma, with a peak between the ages of 46 and 55. In 33 per cent a tumour had been present for three years or longer—an indication that the sarcoma arose from a pre-existing innocent tumour. Gland metastases were found in only 5 of the 60 cases, and 3 of these were lymphosarcomata.

#### TREATMENT.—

##### RESULTS IN 47 CASES FOLLOWED UP.

Dead from operation or sarcoma (2 of these lived more than five years)	..	..	..	19
Dead from natural or unknown causes (3 lived over three years, and 3 more than five years)	..	..	..	7
Well for three or more years	..	..	..	13
Well for five or more years	..	..	..	9

In regard to treatment, irradiation is recommended for lymphosarcoma, and mastectomy, with removal of muscles but without removal of the axillary glands, for other forms of sarcoma.

In the reviewer's opinion, though gland metastasis is unusual, it is better to clear out the axilla. An important point is to remove a large area of skin—much larger than is necessary in carcinoma. Skin-grafting is usually necessary. The reviewer's results show a better post-operative prognosis than for carcinoma, and in this conclusion Fox concurs. He states that the outlook is better if the sarcoma develops in a pre-existing innocent tumour, while in lymphosarcoma it is hopeless. It is pointed out quite truly that only by a frozen section can the diagnosis between sarcoma and carcinoma be made with certainty.

(See also X-RAY AND RADIUM THERAPY.)

REFERENCES.—<sup>1</sup>*Edin. Med. Jour.* 1934, xli, Dec., No. 12; <sup>2</sup>*Ann. of Surg.* 1934, Oct., 779; <sup>3</sup>*Ibid.* 1935, May, 1144; <sup>4</sup>*Brit. Jour. Surg.* 1935, xxii, April, 710; <sup>5</sup>*Lancet*, 1935, Oct. 19, 899; <sup>6</sup>*Genesis of Cancer*, Kegan Paul; <sup>7</sup>*Brit. Jour. Surg.* 1935, xxii, Jan., 456; <sup>8</sup>*Amer. Jour. Surg.* 1935, xxviii, May, 461; <sup>9</sup>*Surg. Gynecol. and Obst.* 1934, Dec., 841; <sup>10</sup>*Brit. Jour. Surg.* 1935, xxii, Jan., 415; <sup>11</sup>*Amer. Jour. Surg.* 1934, xxv, July, 91; <sup>12</sup>*Amer. Jour. Roentgenol.* 1935, xxxiii, 41, abstr. in *Surg. Gynecol. and Obst.* 1935, lx, 417; <sup>13</sup>*New Eng. Jour. Med.* 1934, Oct. 18; <sup>14</sup>*Surg. Gynecol. and Obst.* 1934, lix, Dec., 507; <sup>15</sup>*Brit. Jour. Surg.* 1935, xxii, Jan., 465; <sup>16</sup>*New Eng. Jour. Med.* 1934, cexi, Dec. 20, 1138; <sup>17</sup>*Ann. of Surg.* 1934, Sept., 401.

**BRONCHIECTASIS.***L. S. T. Burrell, M.D., F.R.C.P.*

Advances in the study of this disease in the last year have been mainly surgical. The technique in the operation of *lobectomy* has improved, so that whereas the mortality was about 80 per cent some ten years ago, it is now about 14 per cent. If the patient is prepared by a course of medical treatment, so that toxic symptoms are removed and the tubes are not full of foetid pus, the mortality is only some 6 per cent. In bad toxic cases it is a little over 20 per cent. Much, therefore, depends on the proper preparation for operation by preliminary medical treatment. If, owing to oedema or granulation tissue, pus is pent up in the dilated bronchial tubes, a course of bronchoscopic aspirations may be given with advantage before the operation. Tudor Edwards and Thomas<sup>1</sup> describe the technique and results of the one-stage lobectomy, and their results are extremely good.

Graham<sup>2</sup> advocates lobectomy by means of the cautery, but the improved technique of ordinary lobectomy has rendered this comparatively safe, and the cautery operation is now very rarely employed.

Lobectomy, however, is still a serious procedure, and experience has not yet enabled a judgement of the late results to be given. Cases have been recorded where bronchiectasis has spread or appeared in the upper parts of a lung after the lower lobe had been excised. Before advising the operation it is very important to decide the degree of disability, whether the disease is stationary or progressive, and the extent of the lesion.<sup>3</sup> If the disease is progressive, the prognosis is very serious, and objectionable symptoms make the life of the patient so miserable that even the most drastic treatment is justifiable if the progress of the disease cannot otherwise be checked. If, however, it is stationary, drastic and risky procedures should be avoided unless the damage in the bronchi is sufficiently great to produce symptoms which seriously impair the patient's activities. In children the disease is nearly always progressive, and it is important to prevent spread to the other lung. In older people it may remain unchanged indefinitely, and many patients are enabled to lead a normal life and avoid offensive sputum by emptying the tubes once or twice a day by cough. Posture is of great importance for this purpose, and in acute cases the toxæmia may be relieved, and the spread of the disease may sometimes be checked, by *postural drainage*. Even if subsequently surgical treatment becomes necessary, a course of postural drainage will usually improve the general condition of the patient and render the operation less dangerous.

Nelson<sup>4</sup> emphasizes the importance of accurate localization of the lesion in bronchiectasis before starting postural drainage. He divides each lung into four parts, the upper, the lower, the middle, and dorsal. The dorsal part represents roughly the upper quarter of the lower lobe. He says that lesions in the upper zone should be treated in the sitting position, those in the middle zone in the recumbent position with the patient on his back or face downward according to whether the lesion is anterior or posterior, and those in the lower zone by raising the foot of the bed so that the head is lower than the diaphragm. With a lateral lesion the patient should lie on the opposite side with the foot of the bed raised. In order to drain lesions in the lower zones Nelson advises a special hinged bed so that by winding a handle it rises in the middle. The patient lies prone with the anterior iliac spines opposite the hinges, the head, thorax, and abdomen hang down on one side of the hinge, and the lower limbs on the other. An inclination of 45° can be obtained, but this is too much for most people, especially adults, for whom 30° or even 20° are usually sufficient. By this means a continuous drainage is obtained, and the results are better than in treatment by intermittent posture for only a few minutes two or three times a day.

*Artificial pneumothorax* is rarely indicated. The reviewer<sup>5</sup> recorded the results of 8 patients treated for bronchiectasis by this method. After ten or more years, 2 (one being a bilateral case) are well and at work. One remained unchanged, and so a thoracoplasty was performed, but although alive he still has copious sputum and is an invalid. The other 5 are dead. Of these, one died from cerebral abscess, one as the result of toxæmia from spread of the bronchiectasis, two following thoracoplasty, which was subsequently performed as a result of the failure of artificial pneumothorax, and one improved and remained in fair health for nine years, when she died of pneumonia.

*Thoracoplasty* is a bad operation for bronchiectasis. It collapses the lung tissue, but usually leaves the bronchiectatic cavities untouched. *Phrenic evulsion* also is not successful, and often makes matters worse by producing a flabby diaphragm and lessening the force of cough.

Warner<sup>6</sup> reports five cases of *massive atelectatic bronchiectasis*. One of these he considers congenital, which he regards as a pathological curiosity. He refers to the triangular basal shadow so often seen in cases of bronchiectasis, and thinks this is due to a shrunken bronchiectatic lobe, for injection of lipiodol invariably shows dilated bronchi in that region. He concludes that collapse is a factor in the production of bronchiectasis, and is probably produced in most cases by obstruction of the terminal bronchioles. Fibrosis and pleural adhesions are not necessary in the production of bronchiectasis. Radiographs show thin-walled whorl-like shadows from apex to base in cases of massive atelectatic bronchiectasis.

REFERENCES.—<sup>1</sup>*Brit. Jour. Surg.* 1934, xxii, 310; <sup>2</sup>*Arch. of Surg.* 1925, x; <sup>3</sup>*Practitioner* 1926, cxvii, 183; <sup>4</sup>*Brit. Med. Jour.* 1934, ii, 251; <sup>5</sup>*Lancet*, 1933, ii, 1414; <sup>6</sup>*Quart. Jour. Med.* 1934, xxvii, 401.

## BRONCHIECTASIS: SURGICAL TREATMENT.

A. Tudor Edwards, M.Ch., F.R.C.S.

**Lobectomy and Total Pneumonectomy.**—The recent and rapid advance of the radical treatment of bronchiectasis has resulted in a series of contributions to this subject in the last year or two. Not only have relatively large series of cases of successful lobectomy been recorded, but quite a number of cases of total pneumonectomy. Until about four years ago no patient had survived the convalescent period following total pneumonectomy. Two recent articles by E. Archibald<sup>1</sup> and by J. Alexander<sup>2</sup> have appeared discussing particular points in respect of these operations.

Archibald reviews the history of the procedure, and then proceeds to discuss the various points in the operations both as regards technique and complications. Firstly, anaesthesia is quite rightly held to be a matter of the greatest importance. After considering spinal anaesthesia, as advocated by Shenstone and others, he passes on to a discussion of general anaesthesia, either nitrous-oxide gas with oxygen, or ethylene, or ether. The disadvantages of a general anaesthetic are that it does not prevent shock or the accident of contra-lateral infection through flooding. The author has, therefore, been using an instrument consisting of a very long coude catheter bearing at its end an inflatable balloon of a size to fit the stem bronchus, which prevents the pus contained in the affected lobe from running out of it during operation. Archibald next discusses the question of approach, and considers this to depend upon several factors—e.g., the presence or absence of adhesions, and the disease for which the operation is performed, either bronchiectasis or new growth. It will appear advisable, particularly where it is proposed to do a total removal of a lung for malignant disease, to use an anterior approach, especially on the left side, and to secure the main blood-vessels of the pedicle and follow up by dividing the

main bronchus. Obviously the presence of adhesions will complicate both the postero-lateral and the anterior approaches. In bronchiectasis, however, it is probable that a postero-lateral approach should be used, particularly in view of the fact that the majority of dense adhesions are situated over the posterior aspect of the lung, and are difficult to separate through an anterior incision.

As regards single or two-stage operation, it is obvious that if the same result can be obtained by a one-stage procedure as by a two-stage, the former has everything to recommend it, and this view is held by those who practise this operation. Furthermore, in the two-stage operation, the first stage of which is directed to the production of adhesions between the normal lobe and the chest wall, two measures have been adopted. In one the lobe or lung has been secured by a mass-ligation, and the lung or lobe left *in situ* and allowed to slough away. In the other the major portion of the lung is removed distal to the mass-ligature. In the former, which might be termed the 'delayed amputation of the lung', obviously there is going to be a considerable degree of toxic absorption from the surrounding pleura even when this has been prepared by a previous aseptic pleurisy.

Archibald again stresses the question of tension pneumothorax, and therefore of the considerable risk if no method of post-operative drainage is used. For this reason he advises this measure of safety, which appears to him unobjectionable. Infection of the other portions of the lung, he considers, can be controlled, to a certain degree at any rate, by the use of the inflatable balloon. This, however, does not prevent the infection of the pleura, which is almost inevitable.

As regards obliteration of the residual cavity, it has been shown that in the majority of cases this occurs spontaneously by emphysematous expansion of the sound lung associated with displacement of the heart and a rise of the diaphragm. But a phrenicectomy, either preliminary or late, is usual. In total pneumonectomy thoracoplasty has been performed as an early or late measure in some instances. In Graham's case this was done as a first stage of the operative procedure, i.e., before removal of the lung—a case which was followed by success. The majority of surgeons, however, do not advise such a preliminary operation, and obviously it must add to the dangers of a one-stage operation.

Alexander, likewise, in considering lobectomy, discusses at some length the question of one- and two-stage procedures, of the latter of which he is a strong advocate. He declares that he and his assistant have operated upon 25 patients by this method, 5 of whom have died (20 per cent). He states that, of 82 patients operated on by the two-stage method, there were 12 deaths (14.6 per cent). Alexander appears to advise a temporary phrenic nerve paralysis in preference to a permanent one before unilateral lobectomy. This operation is stated to hasten the closure of the pleural space that remains after the removal of the lobe, and he states that return of diaphragmatic function is desirable. He likewise somewhat condemns the use of artificial pneumothorax as a desirable measure preliminary to lobectomy, advancing as a reason that there is a definite risk of producing an empyema or a pleural effusion and stiffening of the pleura which would tend to delay or prevent eventual expansion and adhesion of the undiseased lobe. It is important to note, however, that Alexander does not advocate a two-stage procedure for lobectomy or pneumonectomy where carcinoma is concerned.

G. A. Mason<sup>3</sup> records two cases of total pneumonectomy in which the lung was left *in situ* after mass ligation and allowed to slough off subsequently. The latter stage shows that the cavity was largely obliterated in the course

of the six months following the operation, and at the time of the report was only the size of a walnut. It was epithelialized, and contained on its floor two bronchial fistulae. In the second patient also there were three residual bronchial fistulae four months after operation. Both these patients, however have been enormously improved by the operative procedure, which was obviously justified.

REFERENCES.—*Ann. of Surg.* 1934, Oct., 796; *Ibid.* 1935, Jan., 393; *Brit. Med. Jour.* 1935, i, 299.

### BRONCHITIS AND EMPHYSEMA. J. F. Gaskell, M.A., M.D., F.R.C.P.

ETIOLOGY AND PATHOLOGY.—The relationship of chronic bronchitis and emphysema and the etiology of these conditions are still matters of controversy, but it is recognized by all investigators that the connection between the two is a very close one, and that the existence of the one without the other becomes the more difficult to establish, the more exactly the two conditions are studied.

Emphysema occurs in two forms, the form which is found in patients who have not yet reached old age, and the senile type which occurs in the old and is of comparatively little importance clinically. The view which is held by recent investigators tends to be that the former type is always obstructive—that is to say, the lung itself is the organ which is primarily at fault. The emphysema and the respiratory and structural changes are secondary to alterations in the bronchial tree owing to spasm or mucous obstruction in the bronchi or bronchioles. In other words, bronchitis in some form, either inflammatory or reflex, precedes and causes the emphysema. The American authors therefore call this earlier form 'obstructive emphysema', and the senile form 'non-obstructive'.

A third clinical condition, namely asthma, must be also considered in its relationship to obstructive emphysema, and the development of emphysema has been more closely studied in cases of asthma than in cases of simple chronic bronchitis. The dividing line is, however, difficult if not impossible to draw, so much so that German authors have reached the conclusion that all cases of chronic bronchitis and emphysema occurring in earlier years have really an asthmatic basis—that is to say, a reflex hypersensitivity of the respiratory apparatus.

In order to study the condition of emphysema, the investigation of the respiratory exchange and the changes from the normal of the various subdivisions of the total pulmonary capacity is essential, and modern American study of the condition by the spirometer, etc., has been largely concentrated on this aspect.

R. V. Christie<sup>1</sup> points out that the various terms in use have been used loosely and are given different meanings by different authors. He proposes a scheme which is most simply explained by a diagram (*Fig. 10*). The total pulmonary capacity—that is to say, the total air in the lung at fullest inspiration—is represented by a column. This is divided up into three parts: (1) Residual air, which is always present even at fullest expiration; (2) Reserve air, which is in addition present and not expired in ordinary breathing; and (3) Complementary air, which with the other two makes up the total capacity. He points out that the physiologically constant level is the resting respiratory level, also called the 'mid-capacity', as at this level, which is that at the end of normal expiration at rest, no muscular activity is taking place, for the elasticity of the lung is up to then the only expiratory force; the respiratory muscles only begin to come into action in forced expiration. The vital capacity, the total air exchange possible with deepest inspiration and expiration, is therefore the sum of the complementary and reserve air, while the functional

residual air is that remaining permanently in the lung in ordinary breathing, being the sum of the reserve and residual air. Christie finds that in any given individual the mid-capacity or resting respiratory level remains constant and that therefore the functional residual air remains constant, though the complementary air and the reserve air show considerable variations purely fortuitous in nature even in a trained and controlled individual. He describes a method of measuring the functional residual air. This scheme of Christie's has been adopted in the American literature.

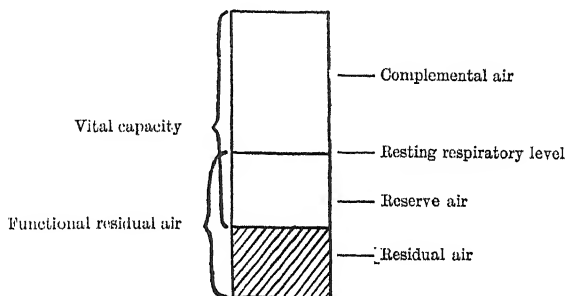


Fig. 10.—Scheme showing pulmonary ventilation and respiratory exchange. (R. V. Christie.)

The study of the changes in chest position and movements has been greatly facilitated by radiography. J. V. Sparks and F. G. Wood<sup>2</sup> give a summary of the X-ray changes found. In their cases of bronchitis and emphysema they almost always obtained evidence of fibrotic changes in the lung parenchyma, often accompanied by adhesions and limitations of the movements of the diaphragm. The costophrenic angle tends to be obliterated and the outline of the diaphragm is irregular owing to the adhesions. These changes are additional to the characteristic changes—the increased clarity of the lung fields, the lowering of the diaphragm, the widening of the costophrenic angle, the increase in the intercostal spaces so that the ribs are more horizontal, and the enlargement of the retrosternal space which becomes more translucent in the lateral view. They found, however, that increased clarity of fields was often patchy, especially in the left lower zone.

Lipiodol injections practically always show that the bronchi have a beaded irregular outline extending as far out as the periphery of the lung fields. There may be also saccular dilatations present. Another quite abnormal appearance consists of a network of fine thread-like bronchi, which is still present post mortem and therefore cannot be due to spasm of the bronchioles. No satisfactory explanation of this has up to the present been found.

J. B. Christopherson<sup>3</sup> has studied radiographically over 200 cases of chronic bronchitis and bronchial asthma, and finds emphysema practically always present. The bronchial tubes almost always show varicose, beaded, or fusiform dilatations, mainly in the tubes of the second to the fifth or sixth degree; the large bronchi are also always dilated. He considers these changes are the result of overaction of the autonomic nervous system. He therefore agrees with the view widely held in Germany that chronic bronchitis and emphysema is a subasthmatic state, brought about by the same agencies as true asthma.

Radiographic evidence thus strongly supports the thesis that chronic bronchitis and emphysema are inseparable and if the one condition is present the other is also.

The anatomical changes in the senile type are, however, of a different character according to W. B. Kountz and H. L. Alexander,<sup>4</sup> who have made an exhaustive study of this type, which they hold to be a truly degenerative change with comparatively little alteration of lung function. Such patients show preponderant abdominal breathing with an increase of diaphragmatic excursion; this may be as high as 16 cm., in great contrast to the marked diminution of movement in the obstructive non-senile type, which may be as low as 1 cm. The authors found with a special apparatus a great increase over the normal of abdominal movement and very little chest movement in the senile type, while, in the obstructive type, breathing was almost entirely by chest movement. The vital capacity is usually diminished, but never so much as in obstructive emphysema; they found an average of 85 per cent in non-obstructive senile emphysema, and only 55 per cent in obstructive. Venous pressure is not increased in non-obstructive, and the oxygen content and CO<sub>2</sub> concentration of the blood are normal. They therefore concluded that alteration of lung function could not be the cause of the senile type, and sought elsewhere for its etiology.

The theory, originally advanced by Freund in 1859, that ossification of cartilages and ankylosis of the costo-vertebral joints was the cause, was not borne out in their series of cases; ossification was not constantly present and ankylosis was comparatively uncommon. They noticed, however, that a constant feature was a straightness and stiffness of the thoracic spine, easily proved by X-ray examination. This straightening caused separation of the vertebral bodies and therefore a separation of the ribs at their attachments, with a rising up of the sternum and an increase of the horizontal diameters of the chest. This the authors proved experimentally by using the bony thorax freed from muscles, etc. Post-mortem material demonstrated both macroscopically and microscopically that the straightening was due to swelling and degeneration of the intervertebral discs, with at the same time irregular absorption of the bodies of the vertebrae. Ultimately the bodies may become so much eroded that kyphosis results; this accentuates the barrel shape of the chest owing to the spine's sinking away from the upper part of the chest which is held up by the clavicles. They therefore hold that senile non-obstructive emphysema is due to bony changes of the chest wall which increase the size of the pulmonary cage.

The changes in the pulmonary mechanism of the non-senile obstructive type of emphysema have been studied by Hurtado and others in America. A. Hurtado, W. W. Fray, and W. S. McCann,<sup>5</sup> in an intensive study of nine cases of pulmonary emphysema, found the vital capacity greatly reduced and the residual air much increased, so that the air volume of the lungs at mid-capacity (resting respiratory level) is much increased; these changes corresponded with the clinical severity of the condition. Forced expiration still, however, expels the normal reserve air. A high ratio of residual air to total capacity always means dyspnoea on exertion. Emphysematous patients on exertion increase the rate rather than the depth of breathing, but when the voluntary expiratory muscles are brought into play the depth is increased and the rate slowed. The maximum ventilation that is possible, the vital capacity, is always decreased. They found that emphysema does not always produce changes in the structure of the thorax; the proof of its presence, therefore, depends on the estimation of the pulmonary capacity and its subdivisions.

In a further paper<sup>6</sup> 26 patients were studied who had chronic bronchitis at intervals, often with bronchial asthma. The shape of the chest in the series ranged from the characteristic barrel shape to the normal. All, however,



had increase of the antero-posterior diameter, limited expansion, low position of the diaphragm, hyper-resonance, and prolongation of expiration, with the radiographic appearances already given in this review. The authors found the total capacity only slightly decreased, averaging a loss of 5.7 per cent. The residual air was more than doubled, averaging an increase of 110 per cent, while the vital capacity was decreased by 39 per cent, due mainly to loss in the complemental air. The average value of the reserve air was practically normal. They studied the expansion of the chest by radiographic films, and, averaging the series, found that the ratio of the area at maximum inspiration to the area at maximum expiration rose from the normal 62 per cent to 73 per cent, thus measuring the loss of expansibility. The movements of the diaphragm fell from the normal 6.3 cm. to 4 cm. and the lateral expansion of the chest from 3.2 cm. to 2.4 cm. They conclude that the degree of disability can be measured by the ratio of the residual air to the total capacity.

R. V. Christie<sup>7</sup> describes an inquiry into the elastic properties of the emphysematous lung in life, holding that no conclusions can be drawn about

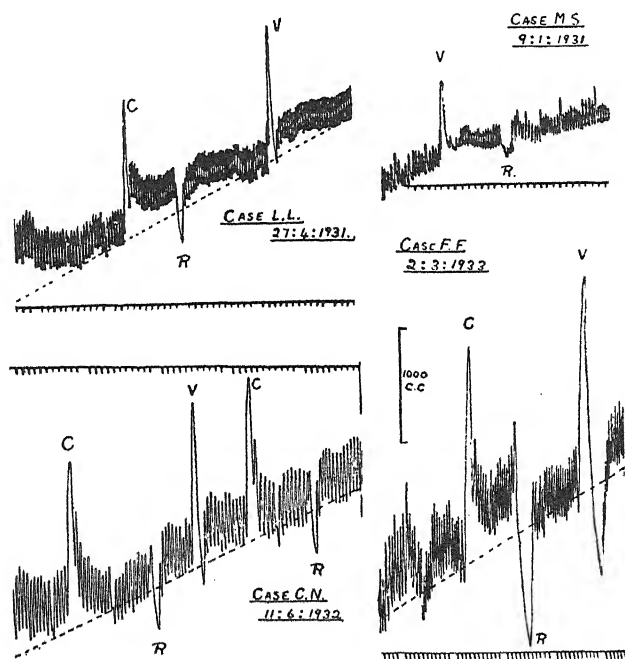


Fig. 11.—The vital capacity in four cases of emphysema, showing the overstretching on deep inspiration and the difference between the volume of reserve air taken alone and that taken at the end of a test for vital capacity. C, Complemental air; R, Reserve air; V, Vital capacity. The irregularity in the resting respiratory level is also well shown. (By kind permission of the 'Journal of the American Medical Association'.)

this from post-mortem investigations. He introduced a small amount of air into the pleural cavity, which was connected with a manometer so as to measure intrapleural pressure. In emphysema the degree of distension of the lung was found to be not proportional to the intrathoracic pressure, showing that the elasticity of the lung is imperfect. This can also be shown and

measured in another way, by taking the vital capacity. In emphysema the loss of elasticity of the lung prevents complete and immediate return to the resting respiratory level after a maximum deep inspiration; also, if the vital capacity test is performed, maximum expiration by voluntary effort no longer can empty the lung to the same extent as after an ordinary inspiration, owing to the slowing and diminution of the elastic recoil. Temporarily the reserve air is lowered (Fig. 11).

Hurtado,<sup>6</sup> in the series he investigated, did not find this lowering of reserve air after deep inspiration to be present in all his cases, only in some, and therefore criticizes this work of Christie's. The latter holds that in bad cases of emphysema elasticity is almost completely lost, expiration being only carried out by the extrinsic muscles and therefore giving rise to a positive intrathoracic pressure. The upward movement of the diaphragm is also due to respiratory recoil; when elasticity is lost it gets fixed at the inspiratory level. This loss of elasticity produces a pressure gradient in the lung causing greatest distension at the periphery and therefore inequality of gas diffusion; the greatest diffusion thus takes place in the distended alveoli, whose walls are atrophic and capillaries damaged and few, so that oxygen absorption is greatly lowered. There is in consequence great waste of effort with diminution of effective tidal air, which may be responsible for some, if not all, of the anoxæmia and CO<sub>2</sub> retention associated with emphysema. A vicious circle is thus established with increasing demand for hyperventilation and decreasing ability to ventilate.

The outcome of these researches into the lung volume and its subdivisions is that in emphysema, though the total capacity is on the whole little altered, the respiratory cycle starts at a much higher level, a level which in normal persons is one of partial inspiration; in order to obtain sufficient ventilation the normal respiratory effort approaches or even reaches the upper inspiratory limit. The inspiratory muscles therefore undergo their well-known hypertrophy in order to add to the efficiency of the upper inspiratory range.

A. Hurtado, N. L. Kaltreider, and W. S. McCann<sup>8</sup> have studied the oxygen saturation and CO<sub>2</sub> concentration of the arterial blood in 24 cases of pulmonary emphysema. They find that anoxæmia is always pronounced and the CO<sub>2</sub> concentration is increased. This can be correlated with the abnormalities of the subdivisions of the pulmonary capacity: if the residual air rises to 45 per cent of the total capacity, anoxæmia is invariably present. They conclude that the deficient alveolar ventilation is the chief factor in producing the anoxæmia of pulmonary emphysema.

A. Hurtado, N. L. Kaltreider, and W. D. Brooks<sup>9</sup> have also examined the plasma, blood, and cell volume in emphysema, and find no noteworthy changes. The total circulation of hæmoglobin per kilo of body weight is also within normal limits. They therefore do not agree that polycythæmia and increase in hæmoglobin are factors in the well-known cyanosis of emphysematous patients.

O. Bruns and R. Herbst<sup>10</sup> have also investigated the changes in lung function in emphysema. They first discuss Herbst's co-efficient of oxygen absorption, which is the amount of oxygen taken up in the blood out of a litre of inspired air, and can be measured from the minute volume of the breathing. This, however, varies very greatly in the normal, as also does the respiratory rate. In the latter the authors have found variation of from three to twenty per minute according to the respiratory training of the individual, athletes showing the lower rates, those with sedentary occupations the highest. In emphysema, when the patient is at rest, all these factors fall within the extremes of the normal range. Investigations are therefore necessary under working

strain. In normals under severe bodily strain a point is reached when the blood can no longer take up to the full the oxygen presented to it in the lung, and the oxygen absorption then sinks. The authors are in agreement with Hurtado, Christie, and earlier authors in respect to the alterations of the respiratory volumes, and emphasize the necessity for hypertrophy of the inspiratory muscles to carry on the increased inspiratory effort needed. They also make the point that in emphysema the inspiratory movement is quickened and shortened, while the expiratory movement is prolonged, being divided into a short initial quick expiratory movement followed by a long slow collapse of the thorax. This form of respiration was found not only in the bronchial asthma type but also in bronchitis and emphysema and all types with a high resting respiratory level. The minute volume of the respiration at rest is increased. They have found that examination of patients under working conditions, partly owing to their respiratory distress and lack of co-operation, leads to unsatisfactory results; they have therefore simulated bronchial asthma and emphysema in trained normal individuals, by an artificial stenosis of the air entry on the one hand, and by fixation of the diaphragm with a tight abdominal bandage on the other, put on in the position of extreme expiration when the diaphragm is fully relaxed. Under severe exertion they got similar results to those in patients. Work could only be carried on for a short time under these conditions, being given up with signs of severe breathlessness. Nevertheless the oxygen lack of the body was never high and cannot be held to account for the severe disability of working power. If, however, in these experiments the rapid shallow breathing that naturally ensues is replaced by trained deep breathing, work can be carried on for a much longer time, yet the ventilation and oxygen absorption is found to be still lower than with undisciplined breathing. Nevertheless cyanosis and breathlessness do not occur, although the oxygen intake is greater with superficial undisciplined breathing. Anoxæmia cannot therefore explain the cyanosis and breathlessness; this must be also largely due to impairment of the circulation.

The venous blood-pressure has been shown by Herbst to rise in undisciplined breathing but to fall with *trained breathing*, and accompanying this rise and fall is a respective diminution and increase of the minute volume of the heart output. The time relations of inspiration and expiration are altered from the normal 1 to 1.15 to 1 to 2 or even 1 to 4 in this rapid shallow breathing; with trained breathing they come back to 1 to 0.96. Now inspiration by its suction effect assists the flow of venous blood into the right auricle, and expiration inhibits it; also inspiration aids the right ventricle by widening the lung capillaries and sucking blood into the lung, and expiration hinders this. The alteration of the inspiratory-expiratory ratio is therefore most important, and contributes largely to the circulatory impairment and the consequent cyanosis and breathlessness. The cyanosis in its turn stimulates the nervous respiratory mechanism, which produces still more rapid and shallow breathing, a vicious circle which is broken by trained breathing. The training of emphysematous patients in respiration is of very great benefit and often allows light work to be undertaken which, without it, is impossible. It is a long process and should be carried on in the case of bronchial asthmatics in the intermittent periods, so that it becomes almost automatic in attacks. It has been found to reduce or even ward off severe attacks.

W. Berger<sup>11</sup> endeavours to substantiate the thesis that bronchitis and emphysema is a minor manifestation of asthma, and that the asthma mechanism acting in a more prolonged way and to a slighter degree is responsible for its production. He points out that asthmatic attacks always have a bronchitic

element in the swelling and exudative reaction of the mucous membrane of the bronchioles, and claims that this condition may spread into the larger bronchi and in time produce constriction of these bronchi, because of the prolonged though slight action of the asthma mechanism. In true asthma attacks of chronic bronchitis often occur apart from true asthmatic attacks, and spasms of coughing may often precede the occurrence of true asthma for many years. Such attacks of chronic bronchitis yield to the same therapy as the true asthma, whether the therapy is physical, nervous, or allergic. Again, attacks of chronic bronchitis without true asthma often show a surprisingly quick diminution of symptoms, pointing strongly to a functional origin. Chronic bronchitis is often accompanied by allergic manifestations typical of true asthma, such as rhinitis, eczema, urticaria, angioneurotic oedema, joint pains and swellings, disturbances of digestion, enteritis membranacea, or mucous colic. When bronchitis and emphysema become established in those of younger years, attacks of shortness of breath, finally developing into true asthma, are not uncommon. Finally, treatment with asthmatic remedies such as *ephedrine* and *adrenalin* is often very successful in bronchitis and emphysema.

A. Engelhard<sup>12</sup> also has investigated cases of emphysema in those of sedentary occupations, and details 26 cases, in all of which the reason for seeking medical help was some nervous manifestation, such as dyspepsia, bradycardia, angina pectoralis nervosa, peripheral vascular neurosis, etc. He therefore concludes that true emphysema can arise owing to disorganization of the vegetative functional mechanism. Chest changes are secondary to these disturbances. He comes into line with Berger in the view that chronic bronchitis and emphysema is brought about by a similar mechanism to that causing true asthma.

**TREATMENT.**—This has already been referred to to some extent, especially the great improvement that can be brought about by *trained breathing*. The value of an *abdominal belt* is stressed by several writers. Christie<sup>7</sup> states that the diaphragm can be raised again in emphysema by increasing the abdominal pressure. This cannot be done by the emphysematous patient unaided, as such a patient usually has a pendulous abdomen with a flabby muscular wall. A suitable belt pressing on the lower abdomen below the umbilicus can, however, increase abdominal pressure sufficiently to raise the diaphragm. This gives great relief to the patient and brings the diaphragm once more into play in inspiration.

H. L. Alexander and W. B. Kountz<sup>13</sup> have observed that patients with advanced emphysema tend to assume positions compressing the abdomen, also that hard pressure just above the symphysis pubis can be shown radiologically to raise the diaphragm in such patients. They have therefore devised a special belt, with an adjustable spring fitting closely to the lower abdomen. The spring is to adjust the pressure for different body positions. The patient soon learns the necessary adjustment to produce maximum relief. The authors have tried such belts on 25 patients with severe obstructive emphysema, and 19 of these had distinct subjective improvement. The vital capacity was increased on the average by 39 per cent. In one patient who wore the belt for six months, the position of the diaphragm and the increase of vital capacity was finally maintained without the belt.

J. Meakins and R. V. Christie<sup>14</sup> give a summary of the methods of treatment of emphysema. They first briefly describe the fundamental changes of the condition, laying especial emphasis on the disturbances of the circulation due to changes in the intrapleural pressure, and the consequent increase of venous pressure and tendency to right heart failure already described in the review of the paper by Bruns and Herbst.<sup>10</sup> They hold that circulatory failure is proportional to the increase in the intrapleural pressure. They also strongly

advocate the value of an abdominal belt, though they do not agree that in subjects trained to give reliable values for the various air volumes there is much increase of vital capacity. Symptomatic relief is, however, marked.

These authors find that *oxygen* often relieves the lowered oxygen saturation of the blood shown by cyanosis. This is especially valuable at night, given for an hour or two before going to sleep. The duration of the effect is surprising. Cardiac failure must be relieved by the usual methods. The use of a belt may in time aggravate the embarrassment of the pulmonary circulation, which may explain the intolerance of certain patients to a belt. Chronic bronchitis and asthma must be treated in the usual way. They agree with the German view that most cases of emphysema present some asthmatic tendency, so that drugs such as *ephedrine* are always worth a trial.

The treatment of bronchitis by drugs, in addition to the provision of a warm constant atmosphere, is universally acknowledged to be important, the most valuable being *potassium iodide*, *ipecacuanha*, and *ammonium carbonate*. In some cases of recurrent winter bronchitis *vaccines* are of value, especially if the same organism is preponderant in the sputum from year to year.

REFERENCES.—<sup>1</sup>*Jour. Clin. Invest.* 1932, xi, 1099; <sup>2</sup>*Lancet*, 1932, ii, Dec. 31, 1419; <sup>3</sup>*Amer. Jour. Med. Sci.* 1933, clxxxvi, Oct. 504; <sup>4</sup>*Jour. Amer. Med. Assoc.* 1933, c, 551; <sup>5</sup>*Jour. Clin. Invest.* 1933, xii, 833; <sup>6</sup>*Ibid.* 1934, xiii, 1027; <sup>7</sup>*Ibid.* 295; <sup>8</sup>*Ibid.* 1935, xiv, 94; <sup>9</sup>*Ibid.* 1934, xiii, 999; <sup>10</sup>*Munch. med. Woch.* 1932, lxxix, 1385; <sup>11</sup>*Wien. med. Woch.* 1934, lxxxiv, 873; <sup>12</sup>*Deut. Arch. f. klin. Med.* 1933, clxxv, 38; <sup>13</sup>*Amer. Jour. Med. Sci.* 1934, clxxxvii, May, 687; <sup>14</sup>*Jour. Amer. Med. Assoc.* 1934, ciii, 384.

### BRUCELLA INFECTIONS. (See UNDULANT FEVER.)

### BUBO, CLIMATIC. (See LYMPHOGRANULOMA.)

### BURNS. (See also WOUNDS AND WOUND INFECTIONS.)

*Str W. I. de C. Wheeler, F.R.C.S.I.*

*Tannic acid* remains the fundamental basis of treatment for burns. The cod-liver oil method mentioned under WOUNDS is worthy of extended trial, especially in areas of the body where tannic acid is contra-indicated, e.g., the face and buttocks. All are agreed on the uses of morphia in the early stages of shock and subsequent pain. Glucose and hypertonic saline solutions intravenously are especially indicated in cases of extensive burns. A pint of 10 per cent glucose in 5 per cent saline is a suitable combination; 5 per cent glucose in normal saline is less likely to cause clotting if the continuous drip method is employed. Blood transfusion will sometimes save the patient who is toxic and shocked beyond the probability of recovery.

Don Weaver<sup>1</sup> describes the technique of treatment. The clothes are removed and heat maintained by warm blankets or with the aid of an electric cradle. As all burns are infected with streptococci, the patient is given gas and oxygen and cleansing of the burnt area is begun. The burnt area is quickly and lightly scrubbed with a soft brush, using water and green soap followed by alcohol and ether. A freshly prepared solution of tannic acid is applied in any suitable manner, more usually in the form of saturated swabs. The hands, feet, buttocks, or the entire body may be immersed in tannic acid. In twelve to twenty-four hours tanning is complete. The patient is then covered with sterile sheets and kept warm with electric bulbs. The coagulum gradually separates, a process requiring two to four weeks, when the healing will be found almost complete. In about 30 per cent of cases signs of infection or deep necrosis appear. Organisms gain late entrance at the margins of the coagulum. To avoid this Weaver recommends painting the margins of the coagulum daily with 1 per cent *gentian violet*. If infection becomes apparent, all the overlying

coagulum must be removed over the infected area. This sometimes requires general anaesthesia. By attention to the above principles and details there was a marked improvement in results. [The reviewer has found that gentle washing with weak lysol solution followed by methylated spirit is sufficient without the aid of soap and a brush.—W. I. de C. W.]

A. M. Clark and R. Cruickshank<sup>2</sup> make some interesting observations on the treatment of burns. They refer to the primary shock and to the dehydration which occurs by the escape of fluid from the blood at the burnt surface and into the tissues in the burnt area. The blood is concentrated and there is a decrease in chlorides. Emphasis is laid on the infection, which becomes manifest in three or four days, but probably begins within twenty-four hours. The *Str. haemolyticus* is the predominant organism: 10 c.c. of concentrated scarlatinal streptococcus antiserum is given on three different occasions, 30 c.c. in all. Dettol has been found more efficacious than other antiseptics in combination with tannic acid in cases of burns. A freshly prepared 5 per cent solution of tannic acid combined with a 20 per cent solution of dettol is applied to the burnt area. It is employed in the form of a moist dressing, which acts more rapidly than when an atomizer is used. Three or four layers of lint are soaked in the solution; these are covered with cotton-wool and held in position by a bandage. The bandage and wool are removed every two or three hours, but the lint is left in position and resoaked with the solution. After eight to twelve hours the entire dressing is removed. A brown coagulum has formed. This is sprayed with 5 per cent tannic acid solution and dried by an electric drier. At the same time a large area of surrounding skin is swabbed over with dettol. The sponging of the surrounding skin with dettol is repeated every four to six hours until the coagulum separates. After the coagulum has separated the general principles of wound treatment are applied. Each day the patient is placed in a bath with running water. Skin-grafting when necessary should be carried out early. Clark and Cruickshank were convinced of the value of dettol after careful comparative investigation in the laboratory. A combination of the treatment just described with the cod-liver oil method referred to above might prove efficacious.

REFERENCES.—<sup>1</sup>*Calif. and Western Med.* 1934, Oct., 222; <sup>2</sup>*Lancet*, 1935, i, Jan. 26, 201.

## CANCER, RADIOTHERAPY OF. (See also X-RAY AND RADIUM THERAPY.) Stanford Cade, F.R.C.S.

The progress made in the radiation treatment of malignant disease is shown in a most striking manner in the Report of the Medical Research Council<sup>1</sup> for the year 1934. The number of cases submitted to radiation as compared to those submitted to surgical treatment continues to increase (*Table I*).

Adding the figures contributed by the various centres for 1930, 1931, 1932, 1933, and 1934, a total of 10,430 cases of malignant disease has been treated, of which 2887 have been treated by surgery alone, making 28 per cent, and 4560 cases have been treated by means of radium alone, making 44 per cent. The report also draws attention to the discrepancy in results obtained at various centres; this variation has led the Medical Research Council to initiate an inquiry, and a questionnaire was circulated to the centres concerned.

**Cancer of the Mouth.**—Interstitial irradiation or surface treatment are the methods employed at most clinics. Where bombs of 1 gm. or more are available, distance radiation is gradually superseding the older methods. The treatment of the lymphatic fields in most institutions consists of a block dissection whenever possible followed by careful radiation to the limits of tolerance of the skin. However, recurrence is reported as being frequent, and these recurrences are very resistant to both radium and X rays. It seems that a more

focal method of treatment, such as that provided by a bomb, is likely to produce improved results. At the Middlesex Hospital<sup>1</sup> cases of malignant disease of the mouth have been treated by means of the 1-grm. bomb in association with either interstitial radium or intrabuccal application. At University College Hospital<sup>2</sup> the 1-grm. bomb has been in use throughout the year. The maximum dosage found practicable to give to a single area was 18 grm.-hours spread over three to four weeks; this produces fairly severe radio-epidermitis. Rapid retrogression of the irradiated lesion is common when the latter does not lie deeper than 2 cm. from the skin or where four or five equidistant ports of entry can be used. In cases where the lesion is deeper, the limit of skin tolerance is not infrequently reached before the lethal tumour dose is delivered. The solution of this difficulty lies in the direction of increased radium-skin distance with corresponding increase of radium element and probably increased filtration. This has been found successful in Westminster Hospital, where, using a bomb containing 2 grm. of radium, a greatly increased tumour-dose can be delivered by increasing the radium-skin distance up to 10 cm. and prolonging the period of treatment up to six or eight weeks. By this method deep-seated tumours of the larynx and pharynx have been adequately irradiated.

*Table I.*—RELATIVE FREQUENCY OF SURGICAL AND RADIOLOGICAL TREATMENT. (MEDICAL RESEARCH COUNCIL. SPECIAL REPORT SERIES NO. 204, 1935.)

METHOD OF TREATMENT	NUMBER TREATED (1934)	PERCENTAGE OF TOTAL NUMBER TREATED
By all methods .. ..	2475	100.0
By surgery alone .. ..	612	24.7
By radium alone .. ..	1145	46.3
By X rays alone .. ..	251	10.1
By surgery + radium .. ..	218	8.8
By surgery + X rays .. ..	106	4.3
By radium + X rays .. ..	118	4.8
By surgery + radium + X rays	25	1.0

**Cancer of the Pharynx and Larynx.**—Radiation treatment of cancer of the pharynx and larynx is discussed by Stanford Cade in the Westminster Hospital report submitted to the British Empire Cancer Campaign.<sup>3</sup> This class of tumours is subdivided into two main groups: (1) Endolaryngeal tumours—comprising lesions of the vocal cords, ventricular bands, and anterior commissure; and (2) Extrinsic laryngeal tumours—comprising, the epilaryngeal group, the posterior and lateral pharyngeal group, the pyriform fossa, and the hypopharynx including the post-ericoid area.

The first group—endolaryngeal tumours—is suitable for interstitial radium treatment. The method was evolved by Finzi and Harmer from the operation devised by Ledoux, with one very important difference—namely, that the radium needles were inserted in close proximity to the lesion without opening the air-passages. This modification was of the greatest practical importance as it rendered the procedure safe and reduced the mortality to a negligible figure. The size, position, and extent of the growth dictate the amount of cartilage to be removed. If the ary-epiglottidean fold is involved, the great cornu of the hyoid is removed in addition to the ala of the thyroid cartilage; in the presence of a subglottic extension a portion of the cricoid is taken away. The access to the lesion is therefore no longer a true fenestration of the thyroid

cartilage, but a more extensive and accurate procedure. In the majority of cases the tumour disappears and the vocal cords assume a normal appearance. The functional result is better than after laryngofissure. Recurrences have occurred locally; in some cases this was due to under-estimation of the extent of the lesion and inadequate irradiation; radiographic control of the treatment showed in a few cases that the needles had slipped and so the radium was no longer in apposition with the lesion. At the Birmingham General Hospital<sup>1</sup> a fresh technique has been adopted. A larger number of needles have been inserted, left in position for eight days. This is followed by deep X-ray therapy through the port-hole in the laryngeal cartilage; it is reported that the early results are noticeably better than those previously attained.

The treatment of the second group—extrinsic carcinoma—is essentially by means of X rays or the bomb. X-ray treatment has been brought to its present position chiefly by the work of Coutard. The real importance of Coutard's work lies in its principles—namely, the protraction of the period of treatment and the fractioning of the dose. These principles when applied to the radium bomb have given results equal and in some cases greatly superior to those obtained with X rays. That the bomb is a real necessity in the treatment of these groups of pharyngeal cancer is obvious from the following observations: (1) The proportion of three-year cures obtained by Coutard is 12 per cent, and for a true perspective it is necessary to focus attention on the 88 per cent of failures as well as on the 12 per cent of successes. (2) Of the various forms of laryngeal cancer, the proliferative type accounts for most of the X-ray successes, whilst the infiltrating type gives very bad results. Radium alone in large quantities, in a suitable container, can be successfully used in this type of tumour. Cade and Allechin,<sup>4</sup> employing 2 gm. of radium in combination with high-voltage X rays, have obtained at the Westminster Hospital during the past four years the results shown in *Table II*.

*Table II.*—COMBINED BOMB AND X RAYS.  
(WESTMINSTER HOSPITAL.)

SITE OF CARCINOMA	CASES	ALIVE (FREE FROM DISEASE)
Pyriform fossa .. .. .	23	7
Post-ericoid .. .. .	10	3
Lateral and posterior pharyngeal ..	7	3
Epipharyngeal .. .. .	12	4
Total .. .. .	52	17

That complete disappearance of pharyngeal cancer can be obtained by means of the radium bomb is an established fact. A great deal of work remains to be done to ensure permanence of results. With increased quantities of radium, accumulated experience, and improved technique, further practical advances are certain to be made, but even to-day the immediate results obtained by radiation are superior to those of the major surgical operations and at a negligible risk.

**Cancer of the Breast.**—The number of cases of carcinoma of the breast in which irradiation is employed increases year by year, and it is a point of great interest to the practitioner and to the public that cases which from a surgical point of view are regarded as hopeless are being successfully treated by a combination of radium, surgery, and X rays. At many centres the method



employed in very advanced cases consists in the local removal of the breast or tumour, preferably by diathermy, combined with irradiation of the axillary and cervical glands. This is done either by needling alone or, preferably, by needling followed by surface application of radium on plaques or X rays. The Surgical Unit of St. Bartholomew's Hospital<sup>5</sup> makes an interesting statement in the latest report to the Medical Research Council. Comparing the results of surgical treatment and radium needling in breast cancer, examination of the five-year survival rates obtained by the Follow-up Department shows that the results of the two methods of treatment are not materially different, being in each case 40 per cent. An attempt to improve results is being made by combining interstitial radium with surgery, the breast being amputated a few weeks after the needling.

(See also BREAST, DISEASES OF.)

**Cancer of the Rectum.**—In the present stage of radium therapy it is recognized that surgical excision gives the patient as good a chance of cure as can be hoped for. Radium therapy, however, proves at times of considerable value in the treatment of rectal cancer. The application of radium results in a number of cases in the arrest of hæmorrhage, partial or complete healing of the ulcerated surface, a diminution of the discharge, less pain, and a retardation of the rate of progress of the disease. In some instances the growth becomes less fixed and in others it becomes transformed into fibrous tissue. The selection of cases suitable for radiation resolves itself into the following: (1) Borderline cases and inoperable cases; (2) Operable cases where operation is contra-indicated on general grounds, or in patients who refuse excisional treatment; (3) When a colostomy must at all costs be avoided or delayed; (4) Pre-operative irradiation, providing the dosage is correct and operation not delayed beyond three or four weeks after irradiation. Delay in the hope of obviating the operation altogether is bad, as it renders the operation more difficult to perform, post-operative convalescence is prolonged, and healing delayed.

**METHOD OF IRRADIATION.**—Technique of irradiation varies with the site, extent, and type of growth. It also depends upon the general health of the patient, the presence of obstruction, and the object in view: mere palliation or attempt at cure.

Most methods previously described have now been abandoned, and the following is given as the only method in which the risk of radiation is small, post-radiation pains negligible, and results encouraging.<sup>6</sup>

The following radium is necessary to carry out the treatment: (1) Forty mgrm. of radium, preferably in tubes of 10 mgrm. each; overall length, 20 mm. Screenage, a minimum of 1 mm. of platinum. (2) Needles of 1 mgrm. per cm. active length, screened by at least 0.8 mm. of platinum; about 30 or 40 mgrm. are required.

**Technique.**—Irradiation consists of a simultaneous intrarectal and perirectal insertion of radium in such a manner that the tumour is submitted to the effects of radium from the periphery from a series of weak foci of irradiation and from the lumen of the bowel from a relatively high source of radiation.

**Perirectal Irradiation.**—The high lithotomy position is necessary. The coccyx is removed, but otherwise no surgical exposure is necessary. The needles are inserted by puncturing the skin and guiding their position by a finger in the rectum. In the male a metal sound is introduced in the urethra, and the prostate and urethra are brought down as near the perineum as possible; in the female the anterior group of needles are placed through the vagina.

**Intrarectal Radium.**—Three or four tubes of 10 mgrm. each are used. They are inserted in a rubber tube of 1 mm. thickness and a knot is tied in between each tube. The total length of the tube is about 16 in. This is inserted with the aid of a proctoscope into the lumen of the growth. The rectum is tightly plugged so as to keep the tube in position; the end of the rubber tube is sutured to the anus in two places.

Both sets of radium are left *in situ* seven to ten days. On removing the radium the growth is seen to be flatter and the surface covered with a film of white fibrin. The immediate results are encouraging and the above irradiation appears to be a step in the right direction. It is far too early to express an opinion on the ultimate results.

**Seeds.**—Some workers advocate the use of seeds instead of needles. They are much easier to introduce and sometimes lead to complete arrest of disease. The introduction of seeds direct into the growth through the sigmoidoscope or proctoscope is, however, not an ideal method and presents definite risks of post-radiation hemorrhage, which may prove fatal. Further study in this method is urgently needed.

(See also RECTUM, CANCER OF.)

**Carcinoma of the Anal Canal.**—This is a squamous-celled neoplasm, in no way different from a skin cancer in any other situation. It is eminently suitable for radium treatment. The ideal method of radiation is by the interstitial method, with needles in preference to seeds. Gabriel quotes 50 per cent success in this type of case, from the cases at St. Mark's Hospital. A greater percentage of success should be obtained if the lesions are completely surrounded by radium and treatment is prolonged for at least seven days.

Surface treatment of inguinal glands should be carried out in all cases of anal carcinoma. Plaques of spongy rubber, felt, or columbia paste are applied to each groin. If the radium skin distance is 4 cm., 100 mgrm. of radium to each groin are applied 12 hours daily for 10 to 14 days. If a distance mass radiation apparatus is available, this can very conveniently replace the plaques, and in such cases hospitalization is not essential.

It should be noticed that neither at the Radium Institute in Paris nor at the Radiumhemmet in Stockholm is radium favoured for rectal cancer. It is, however, essential that further work in this direction be carried out, and the future remains more hopeful than at first seems to be the case on perusal of the literature on the subject.

**Cancer of the Uterus.**—The Marie Curie Hospital<sup>3</sup> reports that it is now the tenth year since the Clinic was established. During this time nearly 1000 cases of carcinoma of the cervix have been treated. An analysis of the results obtained shows that although there has been a general improvement during the ten years, it has not been steadily progressive, the falling off in the percentage of five-year cures in some years being due to the differences in the initial material. The collected results of the ten centres reporting to the Medical Research Council<sup>1</sup> show the figures given in *Table III*.

Malcolm Donaldson<sup>7</sup> states that "the five years' results (of radiotherapy) must convince the most conservative-minded medical man of the value of radiotherapy. It is almost impossible to judge which of the more well-known techniques is the most successful, but there is no doubt in my mind that when radiotherapy is combined with X-ray treatment the final results are superior to either of these methods of radiation used alone."

**Bone Sarcoma.**—An account of bone sarcoma is given by Stanford Cade in the 1934 report of the Mount Vernon Hospital.<sup>8</sup> Radiation treatment of these tumours can be given by radium or X rays, or preferably by a combination of

both methods. Although most bone sarcomata require large doses and prolonged treatment, excessive irradiation, specially by unsuitable methods, causes grave accidents, and the results of treatment can be worse than the disease. To understand the rationale of radiation of bone tumours it is necessary to refer to the various types met clinically. Classification of these tumours has been placed on a more accurate basis by the American Registry of Bone Sarcoma established in 1920. The main groups are as follows; (1) Osteogenic sarcoma; (2) Ewing's tumour; (3) Giant-celled tumour; (4) Myelomatosis; (5) Chondrosarcoma. The classification is of practical nature, as upon the recognition of

*Table III.*—CANCER OF THE CERVIX UTERI. (MEDICAL RESEARCH COUNCIL. SPECIAL REPORT NO. 204.)

YEAR	INTERVAL SINCE IRRADIATION	NO. OF CASES TREATED	STAGE							
			I		II		III		IV	
			L.	D.	L.	D.	L.	D.	L.	D.
1921 ..	13	41	1	3	2	12	0	20	0	3
1922 ..	12	37	1	3	1	10	0	18	0	4
1923 ..	11	62	2	4	0	14	0	34	0	8
1924 ..	10	73	3	5	1	23	2	28	1	10
1925 ..	9	124	6	6	4	21	4	55	0	28
1926 ..	8	145	5	3	4	15	13	80	2	23
1927 ..	7	146	4	4	8	18	18	53	1	40
1928 ..	6	240	16	15	18	44	24	88	6	29
1929 ..	5	234	14	9	20	30	32	98	3	28
1930 ..	4	295	27	19	40	46	37	95	6	25
1931 ..	3	320	29	24	27	51	41	98	3	47
1932 ..	2	312	41	15	46	29	45	98	3	35
1933 ..	1	312	36	6	53	31	64	71	17	34

the various types depends the selection of the method of treatment. The fifth group, or chondrosarcoma, belongs more to the parosteal type and is an extra-periosteal tumour of lower grade of malignancy. The other four groups present very different clinical pictures, pursue different clinical courses, and are of different prognosis. Each of the five different groups presents characteristic histological appearances. The chief clinical characteristics are grouped together in *Table IV*.

**RADIATION TREATMENT OF BONE SARCOMA.**—Interstitial radium treatment has no place in the treatment of bone sarcoma. The results obtained by this method are bad, and the damage done to the normal tissues is so great that the method should be condemned. Surface radiation by plaques is a sound method but presents difficulties of technique, as the quantity of radium required is great and the depth dose to be adequate generally causes severe damage to the skin. Distance radiation with a bomb is undoubtedly the method of choice. It is safe, permits accuracy of treatment, protraction and fractioning of the dose is easily achieved, and in combination with X-radiation has given the best results. By means of this method—with the 4-grm. bomb and smaller units—19 patients were treated at Westminster Hospital, and, of these, 6 are alive and free from disease—one for six years, one for five years, two for three years, and two for two years. The results obtained are tabulated in the *Tables V* and *VI*.

In all cases of osteogenic sarcoma prophylactic X-ray treatment should be given to the chest, even in the absence of any evidence of pulmonary metastasis.

Table IV.—MAIN CHARACTERISTICS OF THE TYPES OF BONE SARCOMA.

TYPE	INCIDENCE	AGE	SEX	TYPES OF BONES AFFECTED	ORDER OF FREQUENCY	SITE OF ORIGIN IN BONE	METASTASES	SITE OF METASTASIS	RADIOGRAPHIC APPEARANCE
Osteogenic sarcoma	Common. 50% of all bone tumours	Years 10—20	$\frac{M}{F} = \frac{4}{3}$	Long bones (any bone)	1. Femur 2. Tibia 3. Humerus 4. Pelvis 5. Fibula 6. Scapula	Ends (metaphysis)	Very frequent	Lungs Other bones	Bone formation and Bone destruction
Ewing's tumour	10% of all bone tumours	5—15	$\frac{M}{F} = \frac{3}{1}$	Short bones, also long bones	1. Tibia 2. Humerus 3. Femur 4. Fibula 5. Clavicle 6. Os calcis	Centre Shaft (diaphysis)	Frequent	Skull bones Lungs	Bone destruction Slight bone formation Vertical striation
Giant-celled tumour	25% of all bone tumours	16—25	Equal	Long bones and jaws	1. Femur 2. Tibia 3. Jaws	Lower end Upper end Centre Epiphysis	Never (with very few exceptions)		Bone destruction
Myeloma	Rarest of all	40—60	$\frac{M}{F} = \frac{2}{1}$	Flat bones	1. Ribs 2. Vertebrae 3. Sternum 4. Skull 5. Pelvis 6. Clavicle 7. Long bones	Centre	Terminal manifestation	Spleen Liver	Bone destruction

A second treatment of both the primary and the chest should be given eight months after the initial treatment. In Ewing's<sup>3</sup> tumour the response to radiation is so rapid that it is of diagnostic value.

(See also BONE TUMOURS; X-RAY AND RADIUM THERAPY.)

Table V.—SARCOMA OF BONE.

TYPE OF TUMOUR	TOTAL	DEAD	ALIVE (FREE FROM DISEASE)
Osteogenic sarcoma .. ..	27	20	7
Ewing's tumour .. ..	6	3	3
Giant-celled tumour .. ..	4	0	4
Multiple myeloma .. ..	1	1	0
Chondrosarcoma .. ..	2	1	1

Table VI.—SURVIVAL OF OSTEOGENIC SARCOMA: SIX CASES.

BONE	BIOPSY	YEARS	TREATMENT
Femur ..	No	6	Bomb and X rays
Tibia ..	Yes	5	Bomb and X rays
Tibia ..	Yes	3	Radium plaque
Scapula ..	Yes	3	Bomb, surgery, and X rays
Humerus ..	Yes	2	Bomb and X rays
Tibia ..	No	2	Bomb and X rays

REFERENCES.—<sup>1</sup>"Medical Uses of Radium", Med. Research Council, Spec. Rep. No. 204; <sup>2</sup>Report on Radiotherapy, Univ. Coll. Hosp. 1935; <sup>3</sup>Brit. Emp. Cancer Camp. 12th Ann. Rep. 1935; <sup>4</sup>Lancet, 1935, Sept. 21; <sup>5</sup>Ibid. Nov. 9; <sup>6</sup>Proc. Roy. Soc. Med. 1935; <sup>7</sup>Post-Graduate Surgery, Medical Publications, 1935; <sup>8</sup>Mount Vernon Hosp. Statist. Rep. 1934; <sup>9</sup>Amer. Jour. Surg. 1935, xxiii, 1.

**CARDIOSPASM.** (See SYMPATHETIC NERVOUS SYSTEM, SURGERY OF.)

## CATARACT.

Sir Stewart Duke-Elder, M.D., F.R.C.S.

**Cataract and Vitamin C.**—An interesting series of experiments have recently been performed in Russia on the etiology of cataract by N. Moniukova and M. Fradkin,<sup>1</sup> associating this condition with a deficiency of vitamin C. It is known that a considerable quantity of ascorbic acid is found in the aqueous humour; the authors confirmed the observation that in the anterior chamber of cataractous patients hardly any ascorbic acid is observed. They believe that ascorbic acid plays an important rôle in oxidation and reduction of the lens. They made a careful experimental study of scorbutic animals, i.e., animals with avitaminosis C, in order to verify the recent data on the metabolism of both normal and pathological lenses. In the first part of the experiment twenty-five guinea-pigs were fed a scorbutogenous diet, hay and oats, for from fifteen to twenty days. The lenses were examined with the slit lamp, and in six animals incipient opacities were observed in the centre and in the posterior layers of the lens in the shape of rings and punctate opacities. The second part of the experiment consisted of a careful puncturing of the anterior chamber with the tip of a keratome in eleven scorbutic guinea-pigs with transparent lenses. On examination with the slit lamp on the second or third day all these animals showed various-shaped opacities in the posterior layers of the

lens. In the third part of the experiment the same operation was done on a few animals which were getting food rich in vitamin C. None of these animals showed changes of the lens.

The next step in the experiment was to establish the correlation between vitamin C and the function of the endocrine gland system in cataractous patients, also the correlation between proteins and carbohydrates in the blood serum of these patients, because of the presumption that high content of proteins and insufficiency of carbohydrates predispose to avitaminosis C. The Luthge-Metz reaction showed a disturbance of the function of the suprarenal gland in cataractous patients. There was also observed the absence of the cysteine reaction in cataractous patients, which indicated a disturbance of oxidation in the lens. The final step in the experiment was the feeding of the scorbutic animals which had acquired cataracts with food rich in vitamin C, but the time of observation in the last stage was too short to justify the drawing of conclusions.

Moniukova and Fradkin come to the following conclusions: (1) Tillman's reaction demonstrates in the normal anterior chamber of the rabbit a high concentration of vitamin C; (2) The aqueous of a cataractous eye has no ascorbic acid; (3) The reducing property of vitamin C plays an important rôle in the oxidation processes of the lens; (4) The high concentration of vitamin C in a normal anterior chamber can be explained by one-way diffusion of ascorbic acid from the blood into the eye; (5) Opacity of the lens is observed only in severe, advanced cases of scurvy; (6) The emptying of the anterior chamber of the scorbutic animal leads to opacification of the lens; (7) A disappearance of vitamin C from the anterior chamber is an etiological feature in opacification of the clear lens; (8) In the light of this experiment, senile cataract is a result of disturbance of the permeability of the eye on a background of general insufficiency of vitamin C.

**Endophthalmitis Phaco-anaphylactica.**—It is well known that after an extracapsular extraction of cataract, especially when a considerable quantity of lens material is left in the eye, an iritis, sometimes of considerable severity, is a commonplace. The theory that this reaction in the eye is due to an anaphylactic reaction to the lens proteins is already well-known from the work of Burky and Woods, as is also their suggestion that sensitive patients should be desensitized before an operation is undertaken. The determination of the sensitivity is by a cutaneous test consisting of an intradermal injection of 0.1 c.c. of a 1 per cent solution of lens extract. A strongly positive reaction consists of the rapid development of an erythematous patch and a wheal; while a mildly positive reaction is represented by a similar appearance developing after several hours and reaching its peak in twenty-four hours. In a recent paper E. L. Goodman<sup>2</sup> tested 700 patients before extraction in this way: 582 (83.1 per cent) showed no reaction; 118 (16.9 per cent) showed a positive reaction, which was strongly positive in 38 (5.4 per cent).

The relation of post-operative ocular inflammation to cutaneous reactions is interesting. Fifty-three patients showed excessive post-operative ocular reactions which could not be accounted for by an accident at the time of operation, post-operative complication, etc. Of these 53 patients, 31 showed no cutaneous reactions and 22 showed cutaneous reactions of some degree. Of the 31 patients with no cutaneous reaction, only 4 (12.9 per cent) showed severe post-operative ocular reactions, while 11 (50 per cent) of the 22 patients showing cutaneous reactions had post-operative ocular reactions of severe degree.

Another interesting point is brought out by the following comparison. Of the 118 patients with cutaneous reactions of some degree, 59 (50 per cent) had

a normal post-operative course, while of the 38 patients with strongly positive cutaneous reactions, only 17 (44.8 per cent) had an uneventful recovery. Also 32 (23.7 per cent) of the 118 patients showing cutaneous reactions of some degree had excessive post-operative ocular reactions for which no specific reason could be found, while 14 (36.9 per cent) of the 38 patients showing cutaneous reactions of + + or greater had such unaccountable ocular reactions.

It was interesting to note, furthermore, that each of the 5 patients who gave strongly positive cutaneous reactions had a severe post-operative reaction, and, incidentally, each of these 5 patients was not seen until long after the capsule of the lens in at least one eye had been opened and there had been plenty of time for autosensitization to develop. This by no means held true for those patients showing milder cutaneous reactions, many of them having perfectly uneventful recoveries. This leads one to the conclusion that severe post-operative ocular inflammation of the anaphylactic type needs to be feared only when the patient has demonstrated marked hypersensitivity to lens protein.

It is interesting that 26 patients showed no cutaneous reaction to lens protein when first tested and showed reactions of some degree when tested after operative opening of the lens capsule; and it is significant that all the markedly positive reactions were obtained only after there had been an opportunity for absorption of lens material from the anterior chamber. It is further of importance that no case of a normal lens showed a positive reaction, so that it would appear that: (1) Hypersensitivity to lens protein occurs only in patients with disease of the lens; (2) Hypersensitivity to lens protein is thus acquired and not congenital. It is not too much to suppose that the ability to respond to a lens antigen with resultant hypersensitivity has a background in which the influences of heredity are prominent. Cataractous cortical material forms the principal antigenic factor.

Reviewing post-operative results Goodman comes to the following conclusions: (1) When lens material is left in the eye of a non-sensitive patient, it is not as great a source of danger as it is when left in the eye of a sensitive patient. (2) The amount of lens material left in the anterior chamber is in direct ratio, generally speaking, to the degree of the post-operative ocular reaction, whether in a sensitive or in a non-sensitive patient. (3) Lens material left in the eye following operation may have a deleterious action through its toxic, mechanical, or anaphylactic properties. The anaphylactic action, when present, is productive of the most severe types of reactions. On this basis Goodman urges the advisability of desensitization prior to operation in sensitive patients. Desensitization must be started with care and the dosage increased according to the degree of the local, focal, and general reactions obtained. No fear about the patient's welfare need be felt if this programme is carried out. The initial dose should be 0.1 or 0.2 c.c. of about a 2 per cent solution of lens protein. The dosage should be increased about 0.2 c.c. at a time until 1 c.c. is reached, and then it may be increased by somewhat larger steps until 4 or 5 c.c. is being given at each injection. A focal reaction is the sign that the amount used should be repeated or decreased rather than increased at the next injection. A general reaction, if mild, may be disregarded. The injections should be given about every four days subcutaneously on the flexor surface of the forearm, where the local reactions may be easily studied.

Every patient who shows a strongly positive reaction to lens protein prior to operation should receive desensitizing injections until there is no reaction to the skin test for a period of two weeks. The maximum dose used in the desensitizing injections should be continued after operation and until the eye that was operated on is entirely healed and the absorption of the lens material has been completed.

Desensitization should not be undertaken during the active stage of endophthalmitis phaco-anaphylactica. The desensitization in all probability could not be accomplished before the endophthalmitis has run its natural course, and the inevitable focal reactions to the injections would only increase the severity of the ocular inflammation and result in greater residual damage to the eye.

Intracapsular extraction should be attempted in all favourable cases when there is any reaction to the cutaneous test with lens protein. If the capsule ruptures, the anterior chamber should be thoroughly irrigated and all the cortical material removed. These statements hold true especially for the patient who shows a marked hypersensitivity and who has not been desensitized. Three illustrative cases may be quoted:—

One of the most interesting cases encountered was that of an exceptionally sensitive person who had suffered from severe endophthalmitis phaco-anaphylactica after each of two extracapsular extractions and after each of two needling operations. He was successfully desensitized, and subsequent irido-capsulotomies which were performed on the two eyes were successful and produced only ordinary reactions. Prior to the irido-capsulotomies there was perception only of light in each eye. The corrected vision three months following the irido-capsulotomies was 6/30 in each eye.

An attempt was made to desensitize one patient with active and severe endophthalmitis following extracapsular extraction. This resulted in aggravation of the process, and it was necessary to enucleate the eye because of the continued inflammation six weeks after the extraction.

One patient with only one eye was found to be fairly sensitive. He was successfully desensitized and then an extracapsular extraction was performed. There was considerable residual cortex following this operation, but recovery was uneventful.

**Sutures in a Cataract Section.**—It is frequently advisable that sutures be inserted in the wound after a cataract extraction, especially in cases where the patient is restless and when vitreous loss has been encountered. All are agreed that conjunctival sutures are of little value as compared with a corneo-scleral suture, but the difficulty of inserting the latter has always made it unpopular; considerable force is necessary to thrust the needles through the tough tissues, so that when inserted in the wound it does not separate the lips to an important extent. The sliding piece is slotted to fit firmly on this part of the shaft and yet be freely movable up and down. The end of the sliding piece is slightly concave, and the needles, 2 mm. apart, project from it each about 0.6 mm. Two of these are to engage in the sclera, the other in the cornea. There is a stop on the instrument to prevent the needles from touching the footplate. The sliding piece has a small lateral arm in the form of a right angle. The third needle projects from this to engage in the sclera. The lateral arm and this needle, when the suture-needle is being passed, serve to hold the sclera in place. The footplate is rectangular in shape, 2.5 × 4.5 mm. in size, and slightly concave on its upper surface. When inserted through the wound it forms a shelf 1 mm. wide beneath the sclera, and 1.25 mm. wide beneath



the cornea. It projects about 3 mm. on one side to support the cornea while the suture is being inserted. Other details of the instrument can best be ascertained from the illustrations (*Figs. 12-16*).



Fig. 12.

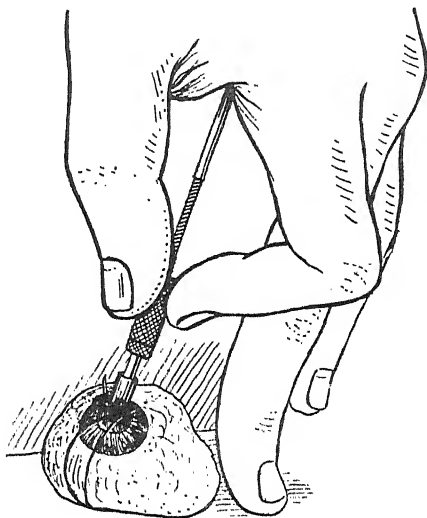


Fig. 13.

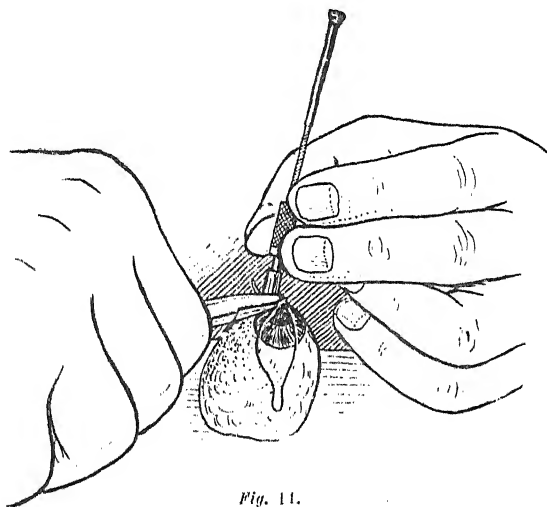
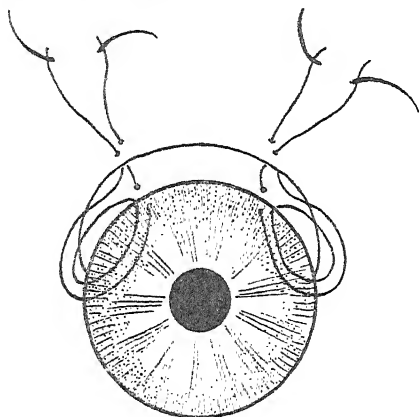


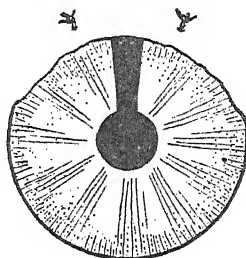
Fig. 14.

By the aid of this instrument any number of sutures may be inserted, but two are sufficient. A conjunctival flap is first dissected back from the limbus where the incision is to be made. The margin of the conjunctiva should be cut exactly at the limbus to avoid any possibility of a tag of conjunctiva later becoming inverted into the wound and thus causing epithelialization of the anterior chamber as sometimes happens after some other methods. The incision

is now made in the usual way, preferably exactly at the limbus. The knurled sleeve on the sliding piece of the instrument is grasped between the thumb and first finger of the left hand and pulled up by holding the knob on the upper end of the instrument against the metacarpo-phalangeal joint of the index finger (*Fig. 13*). The footplate is passed into the anterior chamber at the site selected, and brought against the cornea and sclera. The sliding piece is then slowly released, thus clamping the lips of the wound. In carrying out these procedures care should be taken not to displace the lips of the wound laterally from their natural relative positions. The first suture is now to be inserted; No. 1 black silk thread about 35 cm. in length, armed with two curved needles, is employed. The knob of the instrument is released and the latter held firmly in a comfortable upright position (*Fig. 14*). One needle is entered in the cornea between the body of the end piece and its arm, about 0.75 mm. from the edge of the wound, passed through the corneal stroma at a depth of about one half the corneal thickness, then through the sclera for a distance of about 0.5 mm. In doing this it is best first to push the point of the needle from the



*Fig. 15.*



*Fig. 16.*

(*Figs. 12-16 re-drawn from  
'American Journal of Ophthalmology'.*)

cornea out of the wound a fraction of a millimetre so as to ascertain the position of the point, and then to pass the needle through the sclera. It is important, of course, not to pass the needle entirely through the cornea or sclera into the anterior chamber. As the needle is passing through the sclera it is pointed upward so that the pressure on the sclera is resisted by the small projecting arm of the instrument. The instrument is then removed from the eye, and each of the needles is passed through the conjunctival flap from beneath, the upper needle about 3 mm. and the lower about 1.5 mm. from the cut edge (*Fig. 15*). The instrument is then again introduced in the eye at a different place and a second suture inserted. The two sutures should be about 4.5 mm. apart. An iridectomy, if desired, is now done, and the iris replaced. With a spatula each suture is pulled out from the wound and the loops thus obtained are placed one on each side, out of the way (*Fig. 15*). The cataract is now removed by any method preferred. Each suture is tied by a 'granny knot', and only with sufficient tension to take up the slack. They later become tighter owing to the swelling of the tissues, and never become loose or untied (*Figs. 15, 16*). After the sutures are tied, the margin of the flap should be grasped by smooth forceps and gently pulled upon, especially at the site of each suture, until it is in perfect position.

Verhoeff generally removes the sutures on the eighth day, but in the case of a non-co-operative patient they may be allowed to remain two or three weeks. The sites of the sutures are anaesthetized by a 20 per cent solution of cocaine applied for about thirty seconds by cotton-tipped toothpicks. The knots are cut with scissors; it is important for the latter to be sharp at the points. The sutures are then picked out with forceps. If this is found difficult the sutures may be allowed to remain after cutting the knots. The ends of the sutures should never be grasped with forceps before cutting the knots, as the patient might break open the wound by a sudden movement of the eye. The author finds the removal of the sutures is the most annoying part of this technique.

REFERENCES. —<sup>1</sup>*Sovet. vestnik. oftal.* 1934, v, 97; <sup>2</sup>*Arch. of Ophthalmol.* 1935, xiv, 90; <sup>3</sup>*Amer. Jour. Ophthalmol.* 1934, xvii, 53.

#### CAVERNOUS SINUS THROMBOSIS. *F. W. Wathlyn-Thomas, F.R.C.S.*

E. R. Lewis<sup>1</sup> describes a remarkable case of proved spontaneous recovery, with fatal re-infection later. In 1931 he reported a case in which a patient showed signs of cavernous sinus thrombosis one month after incision of a boil on the left cheek. With these signs there was meningitis and affections of the first eight cranial nerves. The patient was treated by repeated lumbar punctures, and, after four months, recovered with some residual impairment in the nerves. In July, 1933, he developed an acute fulminating right-sided mastoiditis with intracranial complications, from which he died. Post mortem there was found a cerebral abscess which had burst into the third ventricle and recent bilateral infection of the cavernous sinuses. Histological examination proved that there had been a previous infection of the left cavernous sinus.

[This case is noteworthy as proving histologically spontaneous recovery from cavernous sinus thrombosis, an occurrence which has been reported before, but usually has been supported only by clinical evidence. It is interesting also because on the two occasions infection must have reached the sinus by different routes. This suggests some individual liability to cavernous infection, which may explain the rarity of cavernous thrombosis in spite of the frequency of facial suppurations and the recklessness with which they are often treated. —F. W. W.-T.]

REFERENCE. —<sup>1</sup>*Ann. of Otol. Rhinol. and Laryngol.* 1934, xliii, 1084.

#### CEREBRAL ABSCESS. (*See* BRAIN, ABSCESS OF.)

#### CEREBRAL TUMOURS. (*See* INTRACRANIAL TUMOURS.)

#### CEREBROSPINAL FEVER.

*J. D. Rolleston, M.D., F.R.C.P.*

EPIDEMIOLOGY. — The incidence and mortality of cerebrospinal fever throughout the world in 1934 are set forth as follows in an official publication.<sup>1</sup> In Africa, as in former years, the countries most affected have been Egypt and the Anglo-Egyptian Sudan. In the former, however, the number of cases has declined to less than half that for 1933, while in the latter 1934 was marked by an increased severity of the epidemic. In Asia the disease continued to occur in endemic form in the ferts of China and particularly at Shanghai and Hong-Kong. There was a severe epidemic in the island of Formosa, where 273 cases occurred during the first six months. Japan showed a very marked increase in cerebrospinal fever incidence, the number of cases rising from 359 in 1933 to 1225 with 663 deaths in 1934. The number of cases recorded in Manchuria was by no means negligible, but did not reach epidemic proportions. In British India the disease showed a change from its usual sporadic to the endemo-epidemic form, particularly in the Bombay Presidency, where there

were 1221 cases with 645 deaths, and in the urban area of Calcutta, where there were 775 cases and 584 deaths. In the Near East cerebrospinal fever occurred in endemic form. In Turkey, in particular, the number of cases rose from 627 in 1933 to 641 in 1934 with 206 deaths. In Europe the morbidity was highest in England and Wales (1115 cases), Germany (1015 cases), Italy (557 cases), and Poland (526 cases). In North America the morbidity was slightly lower than that in the previous year, and in Australia and Oceania the disease remained sporadic.

In a special report on the incidence of cerebrospinal fever in England and Wales H. T. Morgan<sup>2</sup> states that the notifications which in 1931 had amounted to 2157 in a population of about 40 millions, and in 1932 were 2136, fell to 1695 in 1933. In the West Riding of Yorkshire, where the increase was greatest, the notifications in 1933 were not half the number of those in 1931. The general incidence of the disease, therefore, though still above the normal, shows a well-marked decline. Examination of the serological type of meningococci from 169 cases of cerebrospinal fever during the period April 1, 1933, to March 31, 1934, showed that 112 (66 per cent) belonged to Group I and 57 (34 per cent) to Group II, whereas during the war the epidemic of cerebrospinal fever was caused by meningococci belonging to the two groups in almost equal proportions. During the period 1931-4 the epidemic showed little tendency to spread beyond the West Riding of Yorkshire, although the disease presented some degree of abnormal frequency in the adjacent County of Derbyshire. The cases in which meningococci of Group II were isolated did not differ clinically from those due to Group I, though that may partly have been due to the disease being principally found in infants. In 811 cases in which serum treatment had a fair chance of acting, the fatality was 26.9 per cent, although in many of these cases it was not employed until a later stage.

**SYMPTOMS.**—M. J. Wallfield,<sup>3</sup> who reports an illustrative case, states that the *recurrent or relapsing form* of meningococcus meningitis is rare, as it occurs in only 1 to 2 per cent of treated and in from 15 to 20 per cent of untreated cases, whereas recrudescences are common. The origin of the re-infection in the subsequent attack is either from without, as for example from a carrier of a different type of meningococcus, or more commonly from within, the recurrence in such cases being due to lighting up of little accessible and well protected foci situated in the meninges or the ventricles. Other foci, such as the nasopharynx, accessory nasal sinuses, and even the heart valves, must also be considered, as meningococci have frequently been found in these situations post mortem. A further cause of recurrence is the lowered or even absent immunity of the body. Wallfield's case was that of a boy, aged 7½ years, who had two recurrences, the first in the first seven days after apparent recovery, and the second six weeks after discharge from hospital. Meningococci were found in cultures of the cerebrospinal fluid on the second recurrence, but the blood, nose, and throat cultures were negative. Recovery took place after treatment by intrathecal, intravenous, and intramuscular injection of anti-meningococcus serum.

B. G. Macgraith<sup>4</sup> records a fatal case of meningococcal meningitis in a soldier following fracture of the skull due to a motor accident, and refers to a case reported by Jakob in which meningococcal meningitis followed fracture of the skull and recovery took place after treatment by antimeningococcal serum. Macgraith's patient was probably a carrier of meningococci which entered his cranial cavity either directly through a fissure in the base of the skull or through the blood-stream.

C. J. Duverges and O. Gabré,<sup>5</sup> who report a personal case, state that *cerebrospinal fever in the puerperium* is a very rare event, and is apparently always

fatal, only severe cases having been collected by Bar. The diagnosis must be made from eclampsia by lumbar puncture, which reveals a turbid or purulent spinal fluid containing meningococci, or by measurement of the blood-pressure, which is raised in eclampsia but normal or low in cerebrospinal fever. The writers' case was that of a multipara, aged 35, who developed cerebrospinal fever on the day after delivery, and died in two days in spite of injections of anti-meningococcal serum. The infant did not subsequently develop any signs of disease.

**DIAGNOSIS.**—B. G. Macgrath,<sup>6</sup> who records his observations on 300 spinal fluids, maintains that the polyvalent precipitin reaction obtained by the interaction of polyvalent antimeningococcal serum and the centrifuged spinal fluid is a reliable method of diagnosing meningococcal infection of the cerebrospinal system. Cases of Groups I–III meningococcal infection can be diagnosed in a few minutes from the withdrawal of the spinal fluid by a monovalent precipitin reaction. Probably many Group II infections may be similarly detected by Group II monovalent series. The monovalent Groups I–III precipitin reaction can be demonstrated within twenty-four hours of the clinical onset of the disease.

**PROPHYLAXIS.**—N. S. Terry and A. H. Steele<sup>7</sup> tested 605 children with a toxin prepared from Types I–III cultures of the meningococcus and diluted according to a standard toxin, so that 0.1 c.c. contained a skin-test dose. Those showing a skin reaction of 10 mm. or more in diameter were regarded as susceptible, and received at intervals of a week three subcutaneous injections of an immunizing toxin composed of an equal mixture of the four types of meningococci. Of the 605 tested, 285 (47.1 per cent) gave a positive reaction, and 232 of these were retested after the immunizing injections, when 155 (66.8 per cent) gave negative reactions.

**TREATMENT.**—E. R. W. Gilmore<sup>8</sup> reports a case in a boy aged 17 remarkable for the extraordinarily large quantities of cerebrospinal fluid withdrawn (1182 oz.) and the considerable quantity of antimeningococcal serum injected (642 c.c.). Uncomplicated recovery took place.

H. S. Banks<sup>9</sup> records his observations on 13 cases of cerebrospinal fever treated by Terry's *antimeningococcus antitoxin* prepared by using as antigens soluble toxins of Types I, II, III, and IV meningococci. Eleven cases treated with a regular polyvalent antimeningococcal serum served as controls. Banks found that the antitoxin was a potent therapeutic agent for Types I and III meningococcus meningitis, but that its potency in Type II meningitis was much more doubtful.

R. Traut<sup>10</sup> maintains that *suboccipital puncture* should not be reserved for cases in which blocking has taken place, but should be used as a routine measure alternately with lumbar puncture, not only in infants but at all ages, at least in children.

**REFERENCES.**—<sup>1</sup>*Epid. Rep. Health Sect. League of Nat.* 1935, xiv, 1; <sup>2</sup>*Bull. Off. Internat. d'Hyg. publ.* 1934, xxvi, 1559; <sup>3</sup>*Med. Record*, 1934, cxi, 201; <sup>4</sup>*Lancet*, 1935, i, 863; <sup>5</sup>*Presna méd. Argent.* 1935, xxi, 2330; <sup>6</sup>*Lancet*, 1935, i, 545; <sup>7</sup>*Jour. Amer. Med. Assoc.* 1935, civ, 983; <sup>8</sup>*Lancet*, 1934, ii, 1047; <sup>9</sup>*Ibid.* 1935, i, 856; <sup>10</sup>*Thèse de Paris*, 1934, No. 637.

## CEREBROSPINAL FLUID.

Macdonald Critchley, M.D., F.R.C.P.

**Lumbar Puncture Headaches.**—On more than one occasion in the ANNUAL the subject of post lumbar puncture headaches has been discussed, both from the standpoint of causation and of treatment (MEDICAL ANNUAL, 1931, p. 89, and 1935, p. 249). A recent paper by P. G. Schube and F. Le Drew<sup>1</sup> is of interest in that attention is drawn to the value of sedatives in the prevention of painful reactions after lumbar puncture. Their paper may be compared

with the earlier studies made by S. H. Epstein and G. M. Lott,<sup>2</sup> and by G. V. Kulchar and A. D. King.<sup>3</sup>

Schube and Le Drew's series consists of 350 patients upon whom lumbar puncture was performed under uniform conditions of technique. Of these, 100 patients were given a capsule containing 3 gr. of *sodium amytal*, while the puncture was being performed; 200 patients were given a capsule of 3 gr. of *sodium oral*; the remaining 50 patients received no medication. The percentage of post-puncture reactions is shown as follows:—

GROUP	NO. OF CASES	HEADACHE AND STIFF NECK	NAUSEA AND VOMITING	REACTIONS
Control .. ..	50	10	3	26
Sodium amytal .. ..	100	14	1	15
Sodium oral .. ..	200	24	8*	12

\* These cases also had headaches.

It could not be said that pre-puncture medication caused any delay in the appearance of reactions. The authors found that the symptoms shown in the amytal and oral groups were of a much severer nature, although not of longer duration, than those of the control group.

In Epstein and Lott's series there were 60 patients to whom 6 gr. of sodium amytal had been given; of these 15 (25 per cent) developed reactions. The same authors also employed 3 gr. of *nembutal* in 55 patients. Of these, 11 (20 per cent) developed reactions.

Kulchar and King performed lumbar puncture on 105 patients, to whom 3 gr. of sodium amytal had been given; 16 patients (15.5 per cent) developed reactions. The same writers had injected *codeine* prior to lumbar puncture in 12 patients, of whom 4 (33.3 per cent) developed headaches.

The figures from each group of investigators are not very eloquent witnesses to the high efficacy of pre-puncture medication with sedatives. It is probable that other factors are of great importance in determining whether or not a headache will develop. We would suggest that emotional calmness on the part of the patient, the maintenance of one posture at the time of the puncture, and for thirty-six hours afterwards a horizontal rather than vertical position, the use of a very fine needle, technical efficiency whereby the theca is punctured once only and without probing of the tissues, and the employment of local anæsthesia, are more important factors in the prevention of complications. Provided that all these points are observed, there is nothing but benefit to be expected from the employment of a sedative—whether sodium amytal or nembutal—shortly before the puncture is attempted. By reason of the resulting sleepiness the patient's apprehension is allayed, and abrupt changes in posture are less likely to occur.

(See also SYPHILIS—PREVENTION OF HEADACHE FOLLOWING LUMBAR PUNCTURE.)

**Diagnosis in Cerebrospinal Fluid Contaminated by Blood.**—It is frequently essential to be able to make some pathological investigation of cerebrospinal fluid even when the specimen contains blood contamination. When the fluid is found to be blood-stained, the first matter of importance is to determine whether the blood is of traumatic origin—i.e., due to the actual lumbar puncture—or whether it represents a pre-puncture subarachnoid hæmorrhage. For this purpose a small amount of fluid should be collected

in each of three test-tubes. There are, then, three ways by which a 'bloody tap' can be distinguished from a previous subarachnoid bleeding. In the case of the 'bloody tap' the amount of blood will probably be greatest in the first tube, and least in the third; when previous subarachnoid hemorrhage has occurred, there will be a homogeneous admixture of blood and fluid. Secondly, the formation of a clot indicates a 'bloody tap'. Thirdly, a yellow discoloration of the supernatant fluid, after the specimen has been allowed to stand for a few hours, points to previous subarachnoid bleeding.

In the case of the 'bloody tap' it has recently been explained by P. Solomon<sup>4</sup> how estimations of cell and protein content, the amount of sugar and of chlorides, can be estimated, and the Lange and Wassermann tests carried out. For cell-count Unna's polychrome methylene blue method is advisable. The number of both red and white should be counted, and at the same time a red and white cell-count should be made in the patient's blood. If  $RBC_B$  and  $WBC_B$  represent the cell-counts in the blood, and  $RBC_F$  and  $WBC_F$  those in the cerebrospinal fluid, the true cellular count of the cerebrospinal fluid will be found by the formula:—

$$WBC_F = \frac{WBC_B}{RBC_B} \times RBC_F$$

Chloride and sugar estimations should be carried out on the supernatant fluid, as these are but little affected by contaminating blood.

When the protein content is to be estimated, the determination is carried out on the supernatant fluid. The original protein (P) may be calculated with the greatest accuracy if the red blood-count ( $RBC_B$ ), the serum protein ( $P_B$ ), and hæmatocrit value of the blood (H) are known. If  $P_F$  represents the protein content of the supernatant fluid as determined, and  $RBC_F$  the red count in the fluid—

$$P = P_F - \frac{RBC_F}{RBC_B} \times F_B \times (1 - H)$$

If it is assumed that the serum protein content is approximately 7 gm. per cent, the red count 5,100,000, and the hæmatocrit percentage 43, the formula may be simplified to—

$$P = P_F - 0.0008 RBC_F$$

In other words, unless the patient is markedly anæmic, the original protein approximately amounts to the determined protein in the supernatant fluid, less 4 mgrm. per cent for each 5000 c.c. of contaminating blood. This method is not accurate, of course, if hæmolysis has occurred in the supernatant cerebrospinal fluid.

The examination of blood-stained fluids can, therefore, be summarized, according to Solomon, as follows: (1) The original white count can be obtained by subtracting 1 white cell for every 500 red cells in the bloody fluid. (2) The original protein content can be obtained by subtracting 4 mgrm. per 100 c.c. for every 5000 red cells present, or, roughly, 1 mgrm. per 1000 red cells. (3) The sugar and chloride values are not appreciably affected by contaminating blood. (4) The colloidal gold reaction is not affected unless the red cells number over 5000. Even 25,000 will produce only a few 2's in the curve. (5) A negative Wassermann reaction in a bloody cerebrospinal fluid is reliable, but a positive Wassermann reaction in a bloody spinal fluid is significant only when the blood Wassermann reaction is negative.

REFERENCES.—<sup>1</sup>*New Eng. Jour. Med.* 1934, cexi, Sept. 20, 537; <sup>2</sup>*Jour. Nerv. and Ment. Dis.* 1932, lxxvi, Dec., 593; <sup>3</sup>*Arch. of Neurol. and Psychiat.* 1933, xxx, July, 170; <sup>4</sup>*New Eng. Jour. Med.* 1935, cexi, Jan. 10, 55.

**CHANCROID.**

Col. L. W. Harrison, D.S.O.

Masure and Quérou<sup>1</sup> strongly recommend the following simple method of treating soft chancre. It makes use of two well-tried remedies, *chloride of zinc* and *iodoform*. Every day, or every other day, the ulcers are touched with a 1-3 solution of zinc chloride and then dressed with a 1-3 iodoform and vaseline ointment, which smells only slightly of iodoform. The zinc chloride is applied four times, and the treatment usually lasts eight to fifteen days.

REFERENCE.—<sup>1</sup>*Arch. Med. et Pharm. Nav.* 1934, exxiv, 359.

**CHEIROPOMPHOLYX.**

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

The origin of vesicular eruptions of the palms and soles has given rise to much controversy. The subject has recently been discussed by A. D. McLachlan and W. H. Brown,<sup>1</sup> and by I. Muende.<sup>2</sup> There is considerable difference of opinion as to what should be included under the title 'cheiropompholyx'. McLachlan and Brown include "all cases which present an eruption of the sago-grain vesicle type on the hands and feet." Muende, on the other hand, limits his group to the type of case originally described by Jonathan Hutchinson and accepted by Tilbury Fox. According to these authorities the following factors are present: (1) The rash is preceded by a sense of increased discomfort in the parts to be affected. (2) The eruption then appears spontaneously and symmetrically on both hands without any antecedent erythema; has somewhat deeply placed minute flattish vesicles, which resemble sago-grains embedded in the skin. (3) These vesicles appear scattered, at times irregularly, but at others in small groups along the sides of the fingers and also on the palms; (4) In severe cases these vesicles may coalesce to form large bullae. (5) The eruption undergoes spontaneous resolution without rupture of the vesicles; and (6) The condition tends to recur. Taking only cases which fall into this group, Muende has never had a case in which fungus could be recovered from different vesicles on both hands. In cases where fungus was isolated, the clinical picture was quite different, it being confined to a single patch, and the history showed that this particular place was affected first, and that a generalized non-mycotic rash appeared a week or two later.

More than 50 per cent of the author's cases, giving the clinical picture described above, were associated with fungus infection elsewhere and were thought to be allergic eruptions. About 90 per cent of these had primary lesions of the feet; the rest showed initial infective patches of the fingers, dorsum of the hands, and forearms. All these patients gave positive trichophylin reactions. The author does not consider that any of this group are due to pyogenic infection, as such infections have a different clinical picture; he does, however, suggest that some typical cases may be due to endogenous toxins. In the remainder of cases no endogenous or exogenous factor could be traced.

McLachlan and Brown, who include localized and asymmetrical vesicular lesions in their groups (*Plates XIX, XX*), have reached the following conclusions: (1) That cheiropompholyx is not a disease *sui generis*, but a form of cutaneous reaction due to a great variety of causes, acting singly or together. (2) That it is frequently a contact occupational dermatitis or an expression of a true sensitization dermatitis. (3) That it is a cutaneous reaction of the eczematous type. (4) That in a considerable percentage of cases the hereditary factor is important and that these cases belong to the eczema, asthma, hay-fever group. (5) That there is no valid evidence to support the contention that the disease is either solely due to, or connected with, sweat-gland dysfunction, or is essentially a fungus infection.



*PLATE XIX*

**CHEIROPOMPHOLYX**

(A. D. MCLACTIAN and W. H. LEGG)



Acute cheiropompholyx—recurring type.

*Plates XIX, XX by kind permission of the  
'British Journal of Dermatology'*

*PLATE XX*

*CHEIROPOMPHOLYX—continued*

(A. D. McLACHLAN and W. H. BROWN)



*Cheiropompholyx—exfoliating stage.*

The authors summarize the etiological factors as they have found them in 128 cases examined :—

	CASES
Allergic family and personal history (eczema, asthma, etc.)	17
Focal sepsis, internal or external	25
Pregnancy, menstruation, endocrine disturbance, and neurosis	21
Occupation and acute sensitization	20
Fungus	4
Definite gastric trouble at each attack	3
Drugs	1
No definite cause	37

H. C. Semon<sup>3</sup> considers that all cases can be grouped under three headings : (1) Those due to external irritants, mostly trade or occupational ; (2) Mycotic infections ; and (3) Endogenous causes, associated with toxic absorption, or metabolic causes. In dealing with these cases it is important to determine the presence of any external irritant, and to remove it. In applying local treatment, the vehicle is often more important than the drug incorporated. In unruptured vesicles Semon favours a spirit and dusting powder application, and if fungus is suspected he dissolves in the spirit  $\frac{1}{2}$  to 2 per cent salicylic acid and advises frequent applications during the daytime, with cotton-glove protection in the winter, but without this during the hotter weather. In cases where the fungus has been demonstrated he increases the salicylic acid to 5 per cent or 10 per cent, according to the degree of eczematous reaction present. Cases intolerant to this are painted with 1 per cent gentian violet in 25 per cent surgical spirit, followed by a dusting powder of equal parts colloidal kaolin and starch. When sepsis is present, hand-baths of saline, boric acid, or 1–10,000 potassium permanganate are used for five to six minutes twice daily. Ichthylol 1 to 5 per cent in lead lotion, calamine liniment, or calamine cream is also useful in septic cases, the vehicle being varied according to the stage of the disease. Where deep cracks or fissures are present unguentum plumbi sub-acetatis is employed, and if irritation is marked liq. picis carbonis (30 min. to 1 oz.) or anthrasol can be added. X rays are also of value in this stage, but should only be used in special cases and then under skilled advice.

J. H. Mitchell<sup>4</sup> believes the streptococcus may be responsible for the production of vesicular eruptions of the hands and feet simulating ringworm. He quotes five cases in which no fungus could be found but streptococci were cultured. These cases all cleared up rapidly on perchloride of mercury baths and ammoniated mercury ointment. Some had failed to respond to anti-mycotic remedies previously. He considers these cases analogous to impetigo contagiosa.

REFERENCES. <sup>1</sup>*Brit. Jour. Dermatol. and Syph.* 1934, xvi, Nov., 457 ; <sup>2</sup>*Ibid.* 479 ; <sup>3</sup>*Practitioner*, 1935, cxxxiv, 347 ; <sup>4</sup>*Jour. Amer. Med. Assoc.* 1935, civ, April 6, 1220.

## CHEMICAL WARFARE AND CIVILIANS.

G. E. Oates, M.D., M.R.C.P., D.P.H.

In spite of the fact that the use of poison gas in war is forbidden by the Geneva Gas Protocol of 1925, the risk of an enemy using it remains a possibility which cannot be disregarded. The safeguarding of the civil population against the effects of air attack is almost universally regarded as a necessary part of the defensive organization of any country which is open to air attack. This need not arise from any belief that war is imminent. It arises from the fact that the risk of attack from the air is one which cannot be ignored, and because preparations to minimize the consequences of attack from the air cannot be improvised on the spur of the moment, but must be made, if they are to be effective, in time of peace. The civilian doctor should have some knowledge

of the dangers of poison gas, the precautions to be taken, and the measures of first-aid. The following notes are abstracted from *Anti-gas Precautions and First Aid for Air Raid Casualties*, 1935, being one of a series of Air Raid Precautions handbooks and memoranda published by H.M. Stationery Office for the Air Raid Precautions Department of the Home Office.

By the term 'gas' in warfare is meant any chemical substance, whether solid, liquid, or gaseous, which can produce poisonous or irritant effects on the human body. Such substances are generally liberated in the air as vapours or irritant smokes, but in the case of mustard gas a serious effect is also caused by direct contact of the body with the liquid itself or with objects which have become contaminated by it. Gases are of two types: (1) 'Non-persistent' gases, when liberated in the air, form clouds of gas or smoke which drift along with the wind, gradually becoming mixed with larger quantities of air and consequently less dangerous. Examples are chlorine, phosgene, and the irritant smokes produced from certain compounds of arsenic. (2) 'Persistent' gases are usually liquids which evaporate slowly. The effects persist until the liquid has evaporated, or until steps have been taken to render it ineffective.

The number of effective gases which can be produced in quantity is small. They may be classified according to the effects which they produce on the body.

1. *Choking Gas*.—These are lung irritants, such as chlorine or phosgene, which attack the breathing passages and lungs.

2. *Nose Gas*.—Irritant smokes produced from certain arsenical compounds are in this class, but though they produce intense pain in the nose, throat, and breathing passages during exposure to the gas, these painful effects soon pass off after leaving it.

3. *Tear Gas*.—An eye irritant which even in very small amounts has an immediate effect upon the eyes, causing intense smarting and a profuse flow of tears which generally makes it difficult to see. In pure air the effects soon pass off, and no damage is caused to the eyes.

4. *Blister Gas*.—These cause intense irritation of the eyes and skin. In severe cases deep and extensive blisters may be caused.

The important gases are the following:—

*Chlorine* (non-persistent).—A powerful irritant of the respiratory organs. Exposure causes a burning sensation in the eyes, nose, and throat, which may be followed by bronchitis and pneumonia.

*Phosgene, or Carbonyl Chloride* (non-persistent).—This is a colourless gas at ordinary temperatures, though when liberated as a cloud it usually has a whitish appearance owing to condensation of water vapour present in the air. It has a pungent odour rather like musty hay and is liable to cause coughing. In addition to being a powerful lung irritant, it is also a tear gas. It attacks the air-cells of the lungs, which, in severe cases, gradually become filled with inflammatory fluid, resulting in interference with the passage of oxygen into the blood. In this state exertion will cause the patient to collapse from want of oxygen, and death is frequently the result. For this reason phosgene is sometimes described as having a delayed action.

*Diphenylchloroarsine and Similar Compounds* (non-persistent nose gases).—These arsenical substances can be liberated into the air as smokes, which, like tobacco smoke, really consist of very minute particles rather than actual gas or vapour. Quite small quantities, which are invisible to the eye, will produce intense irritation and pain in the nose and throat, which is often accompanied by sneezing. A greater amount will cause a burning sensation in the chest, headache, and aching in the teeth and gums. These effects are, however, of

a temporary nature and no permanent injury results. High concentrations produce irritation of the eyes.

*Chloroacetophenone* (non-persistent).—This is a white crystalline solid which vaporizes when heated. The cloud so produced is intensely tear-producing. In high concentrations the gas has an irritating effect upon the exposed skin.

*Ethyl Iodoacetate* (persistent).—The liquid as generally used is a dark oily fluid with a pungent smell like pear drops. It is a strong tear gas and in high concentrations a respiratory irritant. It evaporates slowly when spattered on the ground and its effects may persist for some hours.

*Bromobenzyl Cyanide* (persistent).—As generally used, this is a brown liquid with a penetrating smell. The effect of the vapour on the eyes is not quite as intense as that of the previous compound, but the liquid is much more persistent. Under suitable weather conditions the lachrymatory effect may be noticed several days after contamination.

*Mustard Gas, or Dichloro-diethyl Sulphide* (persistent).—This is an oily liquid with a faint but characteristic smell. This may easily be overlooked. It is soluble in fats and is therefore quickly absorbed by the skin. It is readily absorbed by the tarred surface of roads. It evaporates slowly at ordinary temperatures and its effects are very persistent. It is a powerful irritant and this effect can be caused by the liquid or by its vapour. It differs from the gases previously described since it may be dangerous in a number of ways.

1. When the ground or other objects have been splashed with liquid oil, vapour is given off which may injure the eyes, the lungs, or exposed parts of the body.

2. The vapour may also be absorbed by clothing and gradually penetrate to the skin, causing burns even after the wearer has moved out of the dangerous area.

3. If the contaminated ground or splashed objects are touched with the hand or other parts of the body, burns will be caused, unless immediate precautions are taken. Again, if the clothing rubs against anything which is contaminated, the liquid will be soaked up and the clothing may produce blisters. It has also to be remembered that whenever a person has become contaminated he is a source of danger to every one with whom he comes into contact. If he gets mustard gas on his boots and goes into a room containing other people, they may all be seriously affected by the vapour coming from the boots. Danger arises from the fact that the only means of appreciating the presence of the gas is by the sense of smell and that the smell may easily pass unnoticed.

4. Persons may become contaminated by drops of mustard gas which have been released from aircraft in the form of a spray.

The symptoms resulting from exposure to mustard gas do not become apparent until two to eight hours afterwards, by which time it is too late to prevent injury. The eyes are the part of the body most liable to be affected by mustard gas. To remain unprotected in an atmosphere containing even a small amount of vapour for an hour will cause acute inflammation of the eyes. If more gas is present, a much shorter exposure will be injurious. Mustard gas vapour will also affect the respiratory system. Bronchitis or worse injury may result according to the quantity of gas present and the time of exposure. Both the vapour and the liquid will cause burns of the skin. An hour's exposure to even a small quantity of vapour will produce, after the usual delay period, a reddening and scalding of the exposed parts of the body, while high concentrations of the vapour will produce blisters.

*Lewisite, or Chlorovinyl Dichlorarsine* (persistent).—This gas differs from mustard gas in that it contains arsenic, it has a strong smell like that of geraniums,

it is noticed at once owing to irritation of the eyes and nose, and it acts more rapidly. Otherwise its characteristics and effects are generally similar to those of mustard gas.

For a description of the procedure for rendering rooms gas-proof, respirators, protective clothing, the organization of first-aid, and the collection and disposal of casualties, reference may be made to the handbooks and memoranda already cited.

#### TREATMENT OF CASUALTIES.—

*The Treatment of Casualties due to Choking Gas.*—Casualties from lung irritants such as phosgene and chlorine are the most likely to prove fatal of all those arising from chemical agents, and must therefore be treated with extreme caution. After exposure to a poisonous concentration of one of these gases the development of symptoms is as follows :—

The patient experiences a feeling of suffocation with violent coughing and sometimes retching and vomiting. There may be irritation of the eyes. On removal from the poisonous atmosphere these symptoms may lessen or disappear, and the patient appear normal for some hours. If, however, the amount of gas inhaled has been sufficient to cause injury to the lungs, the symptoms will return and gradually become worse. Breathing becomes difficult, and may be interrupted by coughing, which is sometimes accompanied by copious watery expectoration. The patient's colour changes, and he becomes either flushed and purple in the face, with distended blood-vessels, or pallid, with the lips and tips of the ears of a lilac colour. The latter condition is the more serious and indicates that he is not getting sufficient oxygen for his bodily needs. The pulse becomes full and bounding in the flushed cases, and rapid and thready in the pallid cases. If the injury is grave the symptoms described above nearly always appear within twelve hours of the exposure, and if such are not apparent within twenty-four hours the patient may be regarded as out of danger. In all cases of injury from lung irritants the essentials of first-aid treatment are rest and warmth. Tight clothing should be removed or loosened and the patient made to rest quietly in warm blankets. Hot-water bottles should be applied if the patient appears cold. In severe cases the special danger is due to lack of oxygen, and to combat this deficiency, oxygen should be administered continuously and over a long period. The aim should be to tide the case over the critical period of the first two days.

*The Treatment of Casualties due to Nose Irritants.*—In the concentration which can be obtained by war methods these do not cause serious damage to the lungs. Although the patient suffers intense pain and discomfort, little can be done beyond removing him from the poisonous atmosphere. He will recover without many after-effects.

*The Treatment of Casualties due to Blistering Agents.*—The prevention of injury by mustard gas is more difficult than in the case of other types of war gases, because the gas attacks every portion of the body with which it comes into contact, its contact causes no immediate discomfort, and there is a delay of some hours before the onset of symptoms. Splashes of liquid in the eyes are an exception to this rule ; but even in this case, after the first irritation has subsided, there is a delay of about one hour before the injurious effects are fully apparent. Mustard gas readily penetrates the skin and other tissues, and immediately begins to exert its action, though the patient may not be aware of it until the injury has proceeded far enough to give rise to symptoms. The eyes are the most vulnerable part of the body, the lungs and breathing passages come next, and lastly the skin. Moist and greasy skin is more readily affected than parts which are dry. The sequence of events following exposure to mustard gas is as follows :—

Within about six hours the patient's eyes begin to get sore, there is a flow of tears and spasm of the eyelids. At the same time there is a discharge from the nose. The eyes and eyelids become swollen, and discharge oozes between the lids. The pain in the eyes is severe and accompanied by headache. The patient by this time may have developed soreness of the throat, accompanied by a harsh dry cough, and may also complain of pain in the stomach and may vomit. About this time skin burns may appear. At first these show themselves as a diffuse reddening which is often accompanied by intolerable itching. In a mild case nothing more may happen; but in a severe case small blebs soon begin to show themselves in the reddened areas and eventually join together to form large blisters. If much of the vapour has been breathed acute bronchitis will now set in. In the most severe cases of burns caused by mustard gas, the skin becomes a bluish colour, and the bluish areas later break down to form ulcerated surfaces which are very slow in healing.

In the treatment of casualties the first essential is to decontaminate the patient, the special technique of which cannot be described here. When it is known that the eyes have been exposed to vapour they should be carefully washed out with normal saline. After washing, a drop or two of liquid paraffin or castor oil should be instilled between the eyelids to prevent them sticking. Great care must be taken not to rub the surface of the eyes or to put any pressure on them. The treatment for developed burns follows that adopted for thermal burns, but is modified by certain factors. The oozing of serum from the surface lasts for several days, there is greater liability to sepsis owing to devitalization of the tissues, and there is a marked delay in healing.

Mustard-gas casualties usually recover with proper treatment and the death-rate is low, except when severe secondary infection of the lung occurs.

Lewisite produces burns very similar to those caused by mustard gas, but as it contains arsenic, symptoms of arsenical poisoning may also occur in some cases. The delay in the appearance of the symptoms is not so long as with mustard gas. Erythema may appear within twenty minutes of the contamination of the skin by the liquid.

Reference may also be made to the *Manual of Treatment of Gas Casualties*, 1930, Army Council, and published by H.M. Stationery Office.

## CHICKEN-POX.

J. D. Rolleston, M.D., F.R.C.P.

**SYMPTOMS AND COMPLICATIONS.**—In order to determine what influence, if any, an attack of varicella had upon *tuberculosis*, V. Sacco<sup>1</sup> carried out various tuberculin tests on 30 children aged from 6 to 13 suffering from varicella, 15 of whom were normal, 12 had a latent tuberculous infection, and 3 showed definite surgical tuberculosis. Only 7, 6 of whom had a latent infection and 1 surgical tuberculosis, presented any change in the Pirquet reaction, but in all the Mantoux and general tuberculin reactions remained unaffected. Clinical and X-ray examination also showed that no changes had taken place in the lungs following the attack of chicken-pox. Sacco therefore concludes that varicella does not have any effect on tuberculosis.

A case of *fatal chicken-pox in the newborn* is reported by F. Baron.<sup>2</sup> The mother developed a moderately severe attack of varicella on the day of delivery, and the child, a hitherto normal female infant, showed the eruption on the eighth day of life, rapidly became asthenic, and died on the fourth day of disease, without any symptoms of asphyxia or convulsions. The early appearance of the eruption suggests transplacental transmission of the varicella virus.

T. G. M. Ballowa and S. M. Wishik<sup>3</sup> state that among 2534 varicella patients admitted to the Willard Parker Hospital, New York, during the years 1929-33, 123 (5.2 per cent) developed some *complications*, the commonest being pyogenic

conditions, such as otitis media, abscess, suppurative adenitis, cellulitis, and erysipelas. The causal organism was usually a hemolytic beta streptococcus. Septicæmia ensued in 0.5 per cent, and 11 cases (0.4 per cent) died.

J. D. Rolleston<sup>1</sup> reports a case of *femoral thrombosis* following varicella, which appears to be the first example of this complication of chicken-pox on record. The patient was a boy, aged 6 years. The eruption was not very profuse, but a few bullous lesions developed over the left iliac crest, and several of the neighbouring pocks became pustular. Ten days later the whole of the left lower limb became swollen, and the superficial veins were dilated over the left iliac and gluteal regions and front of the left thigh, and the boy complained of tenderness over the palpably thickened femoral vein. Temperature 99° to 99.6° F. The limb was raised and cotton-wool applied. The condition subsided very slowly, and when the child was allowed up at the end of two months from the onset he walked with a very pronounced limp. On his discharge from hospital a month later the circumference of the middle of the left thigh was 1½ in. greater than that of the left, but the walking was almost normal.

REFERENCES.—<sup>1</sup>*Pædiatria*, 1934, xv, 314; <sup>2</sup>*Nourrisson*, 1935, xxiii, 157; <sup>3</sup>*Amer. Jour. Dis. Child.* 1935, xlix, 923; <sup>4</sup>*Proc. Roy. Soc. Med.* 1934-5, xxviii, 1073.

#### CHOLECYSTITIS. (See GALL-BLADDER, SURGERY OF.)

#### CHOLERA.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

ETIOLOGY.—An important study of outbreaks of cholera in Ceylon due to importation from South India by carriers is reported by Lucius Nicholls.<sup>1</sup> In the decade ending 1933 some 200,000 tea estate labourers and other third-class passengers entered Ceylon from India by two routes after being quarantined for five days, and many of them were examined for *V. cholere*. Any found were submitted to agglutination tests and classed as: (1) Agglutinating cholera vibrios; (2) Non-agglutinable ones; and (3) Non-agglutinable vibrios differing morphologically from cholera ones. The effect of bacteriophages in lysing them was also tested. The stools of 100,896 persons revealed 84 agglutinable and 2838 non-agglutinating cholera vibrios of Classes 1 and 2 respectively, a large proportion from estate labourers. A graph showed in four consecutive years a great increase in the number found in relation to the north-east monsoon Ceylon rains of October to January, but little or no correlation to the incidence of cholera in South-East Madras, from which the immigrants came. A full sanitary staff enabled every outbreak in Ceylon to be closely investigated, and the records show that in the hilly regions where the labourers work on tea and rubber estates, of ten appearances of cholera, in seven of which only one person was attacked, all had just arrived from India and had entered the quarantine camps from seven to nine days before. In addition, of three small outbreaks, involving 4, 7, and 13 persons respectively, two were started by immigrants of seven and eight days before, and one was untraced. Of twenty cholera occurrences in the rest of the island, in fourteen only one recently arrived person was attacked, and the total cases in the ten years was only 349, 305 of which were in 1925, when additional labour was imported for large works. The length of time agglutinable cholera vibrios survive in carriers was also investigated, and in the majority it was only six to eight days, and very seldom exceeded three weeks. It is noteworthy that in 5 of 13 cases investigated in a quarantine camp non-agglutinable vibrios appeared in the stools when the agglutinable ones disappeared, and there is no evidence that the numerous non-agglutinable ones, found in so many of the immigrants, ever gave rise to cholera cases, nor do any of the immigrants appear to have



acquired the disease during the journey from India. When we recall that the average yearly deaths from cholera in the Madras Presidency is 31,000, and the southern districts nearest to Ceylon are very liable to outbreaks of the disease, the precautionary measures adopted by Ceylon appear to have been very effective.

*Bacteriophage* in cholera is dealt with once more by J. Morrison,<sup>2</sup> who reports that two new types have been isolated in Assam, bringing the number up to eleven. He claims that better results have been obtained in phage treatment in villages than with hypertonic salines in Calcutta hospitals, but the conditions in the two are not in the least comparable, for the hospital cases are nearly all collapsed very severe ones, while in village outbreaks a considerable proportion are mild. J. Morrison, E. M. Rice, and R. A. Haythorhwaite<sup>3</sup> also deal with the effects of bacteriophage, essential oils, and vaccination on cholera mortality in Assam, and give the mortality among cases treated with essential oil as 36.6 per cent and among phage-treated cases as 21.2 per cent, but among the vaccinated cases it was as high as 45 per cent. The matter is complicated by the extensive use of cholera vaccines during the outbreak and by the phage treatment having been mainly used in the latter part of the outbreak, when the case mortality is nearly always lower than in the early stages. The use of bacteriophage is also dealt with by K. C. K. E. Raja,<sup>4</sup> working in the Madras district of Arcot. He concludes that prophylactic administration of bacteriophage was not effective in reducing cholera incidence, but a reduction in the case mortality was noted, although "the fall in the rate has not been definitely ascribed to any particular cause". Further, it was not found that the curative effects of bacteriophage and prodiarrhoea mixture (essential oils) differed from each other. Thus the evidence of the value of bacteriophage, either prophylactically or in treatment, is as contradictory as ever, and carefully controlled hospital trials are much wanted.

R. W. Linton and his assistants have recorded further highly technical papers on the antigenic structure of the *Vibrio cholerae*. In No. VII<sup>5</sup> he describes the separation of "two acid-soluble protein substances, A and B" from a group of vibrios, but neither was toxic on intraperitoneal injection into guinea-pigs or subcutaneously in rabbits. In No. VIII<sup>6</sup> he reports that the content of reducing substance (carbohydrate) is much greater, 85 per cent of the whole, in A and B fractions as compared with the residue, and fraction A has greater serological activity. In No. IX<sup>7</sup> he states that three factors are at work in dissociation of vibrios: "The first is loss and gain of specific carbohydrate, the second the appearance of a dissociant of an entirely distinct type of protein and carbohydrate, and the third is the situation in which two types of specific carbohydrate are present in a strain, and the equilibrium between the vibrios bearing the two types is unstable". El Tor vibrios form a chemically distinct group. Certain cholera vibrios have proved almost refractory to the influence of bacteriophage in that they are not dissociated to any extent either serologically or chemically even after months.

TREATMENT.—H. Ghosh<sup>8</sup> reports on a trial of an *anti-cholera serum* made by injecting horses with a cholera toxin. With 20 c.c. doses the mortality in 198 cases was 20.2 per cent, but with 30 to 40 c.c. it was only 12.5 per cent in 32 cases, against 34 and 26 per cent in controls.

REFERENCES.—<sup>1</sup>*Ind. Jour. Med. Research*, 1935, xxii, April, 713; <sup>2</sup>*Trans. Roy. Soc. Trop. Med. and Hyg.* 1935, xxviii, April, 563; <sup>3</sup>*Ind. Jour. Med. Research*, 1934, xxii, Oct., 317; <sup>4</sup>*Ibid.* 397; <sup>5</sup>*Ibid.* 295; <sup>6</sup>*Ibid.* 1935, xxii, April, 617; <sup>7</sup>*Ibid.* 633; <sup>8</sup>*Brit. Med. Jour.* 1935, ii, Jan. 12, 56.

**CIRCUMCISION.** (See PENIS, SURGERY OF.)

**CLEFT PALATE.***John Fraser, Ch.M., F.R.C.S.Ed.*

**'Push-back Operation' (Plate XXI).**—The 'push-back' operation of Dorrance was described in the *MEDICAL ANNUAL* in 1933 (p. 109). It is a procedure which has attracted a considerable measure of attention, and it is evident that it has had widespread application. Articles are now beginning to appear which present the results of this operation, and which suggest the indications under which it is likely to be of most value. G. M. Dorrance<sup>1</sup> contributes a paper in order to clarify the position. He complains that he has been misunderstood as saying that all cleft palate cases should have the push-back operation, and continued, "We do not use the operation in cases in which we can obtain velo-pharyngeal closure by the methods generally employed, such as the von Langenbeck operation or any of its modifications." After detailing his conception of the regional anatomy and repeating a description of the operation, he adumbrates what in his opinion are the real indications for it: (1) Congenital shortening of the palate; (2) Cleft velum; (3) Cleft palate which extends as far forwards as the junction of the anterior third with the middle third of the hard palate. These are clear-cut recommendations, and no doubt they will be helpful to inquirers, but one must recall that, with the exception of the first, the indications present the less severe forms of cleft palate error—forms, moreover, which are dealt with successfully by less severe means than the push-back operation. "Congenital shortening of the palate" is a condition with which we are unfamiliar; we presume that it means a congenital shortening of the soft palate associated with symptoms similar to those encountered in cleft palate, and if such a condition actually exists the push-back operation would seem applicable. But to our mind the real criticism of the operation is that it does not take cognizance of the fact that in a cleft palate of any serious degree the bone of the hard palate is so deficient that a push-back procedure is impracticable.

**Dieffenbach-Warren Operation.**—V. P. Blair and J. B. Brown<sup>2</sup> describe this operation in detail. They point out that, though the credit of this technique is generally ascribed to von Langenbeck, the operation was really described by Dieffenbach in 1828 and modified by Warren in 1842. It is unnecessary to repeat the details—they are familiar to all who are interested in the subject—but there is this to be said, that the article supplies one of the most helpful and clear accounts of the operation which we have read. It is the opinion of the authors that this operation is probably the most successful procedure in use to-day, and they give it a strong recommendation. One advantage particularly urged is that, if failure should result, there will be little visible loss of tissue and the flaps will resume their former position without embarrassment to any subsequent operation.

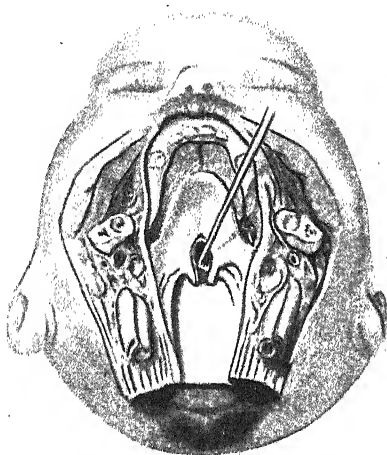
**Veau Operation.**—Under the title "Procedures in Cleft Palate Surgery", R. H. Ivy and L. Curtis<sup>3</sup> recount their experiences with the Veau technique. They criticize the Langenbeck (Dieffenbach-Warren) operation because they claim that it so often results in further shortening of the soft palate, and they express their whole-hearted support for the Veau technique. The article is an excellent account of Veau's methods, though the illustrations are somewhat difficult to interpret.

The results of cleft palate operation by the Veau technique are discussed by K. Mueller<sup>4</sup> in a thesis presented to the University of Leipzig. As an introduction to his principal theme Mueller discusses the interesting question of the influence of heredity, not necessarily of a palate or lip defect but of a malformation of some type. His results support the theory of hereditary error; in 13 cases inheritance of a palate defect was established. The general instability of the organism was displayed by the fact that in 15 instances the cleft

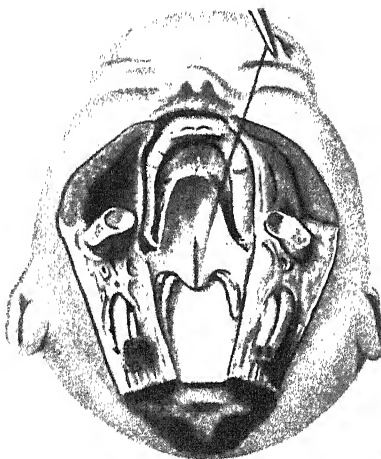
## PLATE XXI

### THE 'PUSH-BACK' OPERATION FOR CLEFT PALATE

(G. M. DORRANCE)



*Fig. A.*—Shows the displaced palate completely free. Note how the ends of the relaxation incision are extended over the pterygomandibular fold. The borders of the cleft velum are also freshened.



*Fig. B.*—Shows the intramuscular wire suture in place and the silk coaptation sutures in the nasal mucous membrane.

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palate error was associated with other types of developmental abnormalities. The results may be summarized as follows. Of 91 cases of cleft palate previously unoperated on, healing by primary union occurred in 67 (73·6 per cent); where the operation had already been performed (as happened in 9 instances) the results were less favourable.

**Pharyngoplasty.**—W. E. M. Wardill<sup>5</sup> continues to be satisfied with the value of pharyngoplasty, in conjunction, of course, with a plastic repair of the palate defect. He believes that the addition of the pharyngoplasty, the result of which is to produce an exaggerated Passavant's ridge, improves the functional results of the operation in a definite and pronounced way, and it is evident that the procedure has become a routine part of his technique. It is interesting to note that Wardill is not convinced of the value of speech training; he claims that, if operation is efficient, the functional results are so good that speech training may be omitted, though he agrees that tuition of this kind is of value in cases in which surgical failure has occurred or in which the operation has been delayed too long. In order to avoid the acquisition of defective methods of speech Wardill recommends that operation should be undertaken at or before the age of two years.

REFERENCES.—<sup>1</sup>*Ann. of Surg.* 1935, ci, Jan., 445; <sup>2</sup>*Surg. Gynecol. and Obst.* 1934, lix, Sept., 309; <sup>3</sup>*Ann. of Surg.* 1934, c, Sept., 502; <sup>4</sup>*Ueber die Ergebnisse der Gaumenplastik nach Victor Veau an Hand von 100 Fällen*, 1934; <sup>5</sup>*Lancet*, 1935, i, June 22, 1435.

## CLIMATIC BUBO. (See LYMPHOGRAULOMA.)

## COLDS.

Ivor J. Davies, M.D., F.R.C.P.

A. T. Todd<sup>1</sup> (Bristol) outlines a form of symptomatic treatment for the common cold which has been evolved slowly at the Bristol Royal Infirmary. Early application is essential, and its action would appear to be twofold: first, an immediate antiseptic action on the nasopharyngeal mucosa, with a delayed chlorine action from the ammonium chloride in the coryza mixture; and, secondly, a decongestive action on the nasal mucosa from the salicylate-chlorodyne complex in the coryza mixture. Those subject to colds should take a daily dose of one of the active preparations of vitamin B (Bemax, one tablespoonful) and of vitamins A and D (Radiostoleum, 3 to 6 drops).

The chlorine mixture is prepared as follows:

R Potassii chloratis	gr. 50	Syrupi	$\frac{1}{2}$ oz.
Acidi hydrochlorici	℥ 30	Aquam	ad 1 oz.

Allow the chlorate to stand in contact with the acid in a stoppered bottle for ten minutes. Then add some water and shake. Next add the calculated amount of syrup and any water to make up volume. The dose is two or three drachms in one ounce of water for an adult. It should not be administered more than three in 24 hours, and should be stopped after a day or two, or methæmoglobinæmia may result. This mixture does not remain active for more than about two weeks.

The coryza mixture is made up as follows:

R Sod. salicylatis	gr. 6	Syr. toltan.	℥ 30
Tinct. chlorof. et morph. eo.	℥ 5	Ext. nucis vom. liq.	℥ $\frac{1}{2}$
Ammon. chloridi	gr. 5	Syr. limonis	℥ 30
Tinct. cinchonæ co.	dr. 1	Glycerini	℥ 15
Tinct. catechu	℥ 15	Aquam	ad 1 oz.

This prescription is rather formidable, but it is stated that no single constituent can be omitted without unpleasant symptoms arising in some patients. It keeps well in the dark, and one ounce is first given, followed by half doses frequently.

A chloretone nebulant has the following formula :—

R Chlorbutol	gr. 15	Ol cinnam.	℥ 4
Camphor	gr. 37	Paraff. liq. leve ad	oz. 4
Menthol	gr. 37		

This keeps well. It is not essential to the treatment, but definitely improves the results.

**Method.**—As soon as the cold appears to be certain the dose of chlorine mixture in water is sipped by drops, and retained in the throat as long as possible before being swallowed, and is taken after a meal. About 15 minutes later the patient should sip the coryza mixture diluted with equal parts of water. Both mixtures having been consumed, the patient should spray his nose thoroughly with the nebulant, and should repeat the process several times that day, even though symptoms have disappeared. The doses should be proportionately reduced for children. It must be added that the treatment is not applicable to patients with chronic sepsis of the upper nasal passages.

REFERENCE.—<sup>1</sup>*Practitioner*, 1934, cxxxiii, Dec., 730.

### COLITIS, ULCERATIVE.

H. Letheby Tidy, M.D., F.R.C.P.

E. I. Spriggs<sup>1</sup> (Ruthin) reviews his experiences with 35 cases of ulcerative colitis, the average age of the patients being between 40 and 50 years. He believes that the disease usually occurs in those who have been unhealthy from some other cause, and 14 of the cases had also some rectal disorder, including piles, fistula, and fissure. In treatment he follows the lines of a medium diet. Intestinal douches are commonly employed, the usual fluid being normal saline. The article is illustrated with very fine radiographs taken in association with Mr. O. A. Marxer. They find that the radiological features usually associated with severe colitis are irregular segmentation and spasm, but they are not to be regarded as proof in themselves of ulceration.

T. T. Mackie<sup>2</sup> (Boston) has studied the *factor of vitamin deficiency* in 75 cases of chronic ulcerative colitis. He regards as indications of such deficiencies the condition of the mucous membrane of the mouth, the type of anæmia, and the blood chemistry. He believes that the deficiency disease is the essential part of colitis and is not to be regarded as a complication. The deficiencies are multiple, involving most of the vitamins.

REFERENCES.—<sup>1</sup>*Quart. Jour. Med.* 1934, xxvii, Oct., 549; <sup>2</sup>*Jour. Amer. Med. Assoc.* 1935, civ, Jan. 19, 175.

### COLON, SURGERY OF.

A. Rendle Short, M.D., F.R.C.S.

**Ulcerative Colitis.**—The treatment of this disease is normally a medical problem, but if the patient is going downhill in spite of treatment, there is a valuable place for surgery. In a paper by R. B. Cattell,<sup>1</sup> of Boston, appendicostomy for purposes of lavage is mentioned only to be condemned as inadequate. If the disease is limited, as it sometimes is, to the distal colon, a colostomy well above the infected area is very useful; it may be preliminary to resection of the rectum and sigmoid colon. An ileostomy, which will have to be complete and permanent, is often the best treatment when the whole of the colon is involved. Complete colectomy carried out in stages is the surest method of cure in serious intractable cases, and the mortality is low. Occasionally the disease is limited to part of the colon, and a partial resection will suffice. At the Lahey Clinic, of 21 patients operated on, 14 had ileostomy, of which 5 died. Three have had complete colectomy, and 6 a partial colectomy.

**Adenoma and Polyposis of the Colon and Rectum.**—Two papers on this subject, by J. P. Lockhart-Mummery,<sup>2</sup> and V. C. David,<sup>3</sup> of Chicago,

reiterate the danger that these growths may recur again and again or become cancerous. After local removal the patient should be re-examined every four months and any bud of recurrence destroyed with the cautery. Biopsy is unreliable.

#### **Carcinoma of the Colon.—**

*Pre-operative Treatment.*—F. W. Rankin<sup>4</sup> attaches great importance to this. In the absence of acute obstruction, the colon should be decompressed by enemata and mild aperients for three to six days, at the same time as hydration is accomplished by giving large quantities of fluids and fruit juice, and a blood transfusion even if the patient is not anæmic. He also believes in the value of intraperitoneal vaccination with a streptococcal and *B. coli* vaccine, which has been associated with a reduction of the mortality from 22·4 to 4·9 per cent, but he allows there were other factors. E. B. Potter and F. A. Coller<sup>5</sup> also refer favourably to the intraperitoneal vaccine, but their figures are not very conclusive.

*Operative Methods.*—Rankin points out that fixation of the growth to the bladder, uterus, or abdominal wall does not necessarily preclude resection, as the adherence may be inflammatory and clear up after drainage, or a portion of the viscus involved may be removed. Growths of the right colon are dealt with in two stages, the first an ileo-transversostomy, followed later by the excision of the right colon. If a one-stage operation is done, there should be a complementary ileostomy proximal to the anastomosis. In 62 ileo-colostomies he had 4 deaths. S. Harvey,<sup>6</sup> on the other hand, writes in favour of the one-stage operation for diseases of the cæcum and right colon; only 2 died out of 29 cases, 18 of which were for cancer. For cancer situated between the middle of the transverse colon and the rectum, if pre-operative decompression can be thoroughly carried out, Rankin advises 'obstructive' (also called 'occlusive') resection, which has been described in recent numbers of the MEDICAL ANNUAL. If it is not available, the Mikulicz operation still holds the field. If acute obstruction is present, an emergency cæcostomy or colostomy is indicated. Rankin has given up immediate resection and end-to-end anastomosis as a primary operation for growth of the left colon. The risks are too high. D. P. MacGuire,<sup>7</sup> of New York, always does a preliminary cæcostomy wherever the cancer is situated. For resecting growths of the right colon, a Mikulicz operation is performed, using the terminal ileum as the proximal and the hepatic flexure as the second barrel of the double-barrelled resection, with a Pezzer tube inserted through another ileostomy 12 in. higher up to keep the junction clean. [This seems cumbrous.—A. R. S.]

V. C. David<sup>8</sup> writes on the treatment of cancer of the recto-sigmoid junction. If it is desired to avoid the abdomino-perineal resection, after opening the abdomen he frees the rectum all round from peritoneum, bladder, and cellular tissues, and pulls it well up into the abdomen. The growth is then resected, leaving the inferior mesenteric and superior hæmorrhoidal arteries undamaged; then the deperitonialized rectum below the resection is covered with peritoneal flaps from the pelvic floor, and the sigmoid and rectum are brought outside side-by-side as in the Mikulicz operation. The anterior parietal peritoneum is stripped from the abdominal muscles and pushed down on to and sutured to the posterior parietal peritoneum to obliterate the pelvic pouch. The two loops are clamped as in the operation of occlusive resection. The spur is crushed later, and after three months the artificial anus is closed. Of 8 cases, none died, 5 are alive and well, and 3 recurred, but not locally.

*Colostomy.*—W. B. Gabriel and O. V. Lloyd Davies<sup>9</sup> discuss the value of colostomy for inoperable cancer of the rectum. The mortality in 500 cases at St. Mark's Hospital was 13·4 per cent; in a parallel series where the colostomy was performed as a first stage in resectable cases the death-rate was only 2·5

per cent. Death was due in 12 cases to peritonitis, and in 5 to obstruction; in 2 of these a knuckle of ileum was found strangulated at the side of the colostomy. The others mostly died of heart failure, bronchitis, or toxæmia. Duration of life after colostomy was under twelve months in about half the cases; 30 per cent lived between one and two years; and 6 per cent survived three years. Late complications were: (1) *Stenosis*, which is frequent and may need operative dilatation; (2) Ventral hernia (10 per cent), due either to the incision being neither within the rectus muscle nor through the oblique muscles but at the outer border of the rectus, or to the wearing of a cup variety of belt instead of the proper flat supporting belt; (3) Prolapse—rather rare; (4) Spur retraction, so that feces pass on into the rectum, for which another operation is necessary; and (5) Fistula into the colon—quite rare. The authors put in a plea for immediate opening of the colostomy. [We heartily agree. This has been our practice for many years. It is perfectly safe, diminishes post-operative pain, and saves the patient the ordeal of seeing it opened later.—A. R. S.]

REFERENCES.—<sup>1</sup>*Jour. Amer. Med. Assoc.* 1935, Jan., 104; <sup>2</sup>*Lancet*, 1935, i, 1149; <sup>3</sup>*Ann. of Surg.* 1934, Nov., 933; <sup>4</sup>*Surg. Gynecol. and Obst.* 1934, Sept., 410; <sup>5</sup>*Ann. of Surg.* 1935, March, 886; <sup>6</sup>*New Eng. Jour. Med.* 1934, Dec., 1040; <sup>7</sup>*Surg. Gynecol. and Obst.* 1934, Nov., 762; <sup>8</sup>*Ibid.* Sept. 491; <sup>9</sup>*Brit. Jour. Surg.* 1935, Jan., 520.

### CONJUNCTIVA, DISEASES OF. *Sir Stewart Duke-Elder, M.D., F.R.C.S.* Conjunctivitis.—

*Bacteriology.*—Within the last few years a considerable amount of work of no small interest has been done in the cause of conjunctivitis of various types. There are several groups of cases of inflammation of the conjunctiva in which, so far, no causal micro-organism has been found, the most important of which is trachoma, and recent work goes to show that in several of these a virus infection may be responsible. These cases in no way belittle the importance of organisms of microscopic dimensions in conjunctivitis, and an interesting paper by J. C. Michaelson (1935) gives a very comprehensive and accurate survey of the position so far as this group is concerned. Analysing the bacterial findings in 371 cases of conjunctivitis he found the flora shown in *Table I*.

*Table I.*—ANALYSIS OF BACTERIOLOGICAL FINDINGS IN 371 CASES OF CONJUNCTIVITIS AND BLEPHARITIS.\*

ORGANISM	NUMBER OF CASES	PERCENTAGE OF CASES	PERCENTAGE OF PURE INFECTION CASES
<i>Sta. albus non-hæmolyticus</i> ..	92	25.0	100.0
<i>Sta. albus hæmolyticus</i> ..	26	7.0	58.0
<i>Sta. citreus</i> ..	2	0.5	100.0
<i>Sta. aureus non-hæmolyticus</i> ..	34	9.2	56.0
<i>Sta. aureus hæmolyticus</i> ..	13	3.5	54.0
<i>Str. non-hæmolyticus</i> ..	25	7.0	60.0
<i>Str. hæmolyticus</i> ..	6	1.6	67.0
<i>Pneumococcus</i> ..	36	9.7	39.0
<i>Morax bacillus</i> ..	54	14.6	30.0
<i>Koch-Weeks' bacillus</i> ..	63	17.2	30.0
<i>M. catarrhalis</i> ..	34	9.2	32.0
<i>B. subtilis</i> ..	3	4.3	100.0
<i>B. xerosis</i> ..	12	3.0	100.0
<i>B. coli</i> ..	3	0.8	—
<i>Pneumobacillus</i> ..	1	0.3	—

\* It is to be noted that several cases showed more than one organism on culture.



Of considerable interest also is his analysis from the literature seen in *Table II*, showing how variable is the incidence of the organisms in different parts of the world. Thus, the incidence of the pneumococcus varies from 3 per cent in such places as Switzerland, Aberdeen, Egypt, France, and Hungary, to 19 per cent in North Caucasia. The incidence of the Morax bacillus varies from 4 per cent in America to 58 per cent in Germany, and that of Koch-Weeks' bacillus from 3.6 per cent in North Caucasia to 38 per cent in Aberdeen, 52 per cent in Egypt, and 60 per cent in Palestine. The figures of 20 per cent for Koch-Weeks' bacillus in Glasgow and 16 per cent for the Morax bacillus accentuate the geographical variation, and indicate how, at least in the case of Koch-Weeks' bacillus, there can be an incidence-variation at different periods in one place. Various factors, such as the time of the year when most of the examinations were made, and the method used by different investigators, undoubtedly affect the comparability of the results. If the times and methods of investigation were constant, it is quite possible that a study of such variables as average rainfall, temperature, and standard of living, as represented by, say, the average number of persons living in a single room, might be found to explain the geographical variations.

*Table II.*—PERCENTAGE INCIDENCE OF BACTERIAL CONJUNCTIVITIS IN DIFFERENT PARTS OF THE GLOBE.

LOCALITY	PNEUMO-COCOCCUS	MORAX BACILLUS	KOCH-WEEKS' BACILLUS
Glasgow, 1934 (272 cases)* ..	10.0	16.0	20.0
Glasgow, 1904 .. ..	3.5	11.0	52.0
Aberdeen .. ..	3.0	33.0	38.0
Germany (Freiburg) .. ..	4.0	58.0	5.0
Germany (Westphalia) .. ..	5.0	13.0	27.0
France (Paris) .. ..	3.0	37.0	25.0
Switzerland .. ..	3.0	54.0	5.0
Hungary (Budapest) .. ..	4.6	45.0	15.0
Latvia (Riga) .. ..	11.0	23.0	36.0
North Caucasia .. ..	19.0	21.0	3.6
Palestine .. ..	?	?	60.0
Egypt .. ..	3.0	12.0	52.0
U.S.A. .. ..	17.0	4.0	34.0
U.S.A. (St. Louis) .. ..	—	30.0	11.0
Uruguay .. ..	12.0	30.0	4.0

\* The remainder were: *Staphylococcus*, 34.0; *Streptococcus*, 7.0; *M. catarrhalis*, 10.0; *B. subtilis*, 1.0; *B. xerosis*, 4.0; *B. coli*, 0.3; *Pneumobacillus*, 0.3.

A final point of great interest brought out by Michaelson is the common association between dental disease and conjunctivitis due to the streptococcus and the *Sta. albus haemolyticus*: 33 per cent of the cases of the former and 28 per cent of the latter showed this correlation—a fact of extreme importance in the treatment of conjunctivitis.

So far as staphylococci are concerned, their very common occurrence has been frequently observed; G. H. Gower (1934) has done some interesting experiments showing the source of these organisms from the skin of the lower lid. It is to be remembered that the upper eyelid is longer than the lower, has a convex border, and is the active factor in tititation in the human. The lower lid has a flat or concave border and is relatively inactive. When the eye is closed the upper lid definitely overlaps the lower lid, forcing the lashes of the lower lid down against the skin. The lower lashes are continually moist, and

there is a border of skin along the border of the lower lid, about  $\frac{1}{8}$  in. wide, which is also moist. In those subjects having *Sta. aureus* or *citreus* on the skin around the eye, the *Sta. aureus* and *citreus* strains can be recovered from the conjunctiva; those having only *Sta. albus* on the skin will show only the *Sta. albus* type in the conjunctiva.

As an experimental test-organism Gower used a twenty-four-hour agar culture of *B. prodigiosus* because of the ease with which this organism can be cultured and identified, and also because it is foreign to the human eye. From experiments wherein the skin of the upper and lower lids were inoculated and also the lashes, he concluded that, except for the influence of a factor not ordinarily present, the skin of the upper eyelid is not a source of contamination to the upper lash and plays no part in conjunctival contamination. The skin of the lower eyelid, however, serves as a heavy source of contamination to the lower lash. Contamination occurs readily from upper to lower lash and vice versa, but the more rapid disappearance of organisms from the lower lash suggests a mechanical removal by the action of the upper lid. As long as organisms are present on the lower lash in sufficient numbers they can be recovered from the conjunctiva, but with the disappearance of organisms on the lower lash, conjunctival contamination ceases. The fact that staphylococci are constantly present in the conjunctiva is due to the continual contamination of the lower lash by the skin, facilitated by nictitation, and mechanical introduction into the conjunctival sac by the action of the upper lid.

To turn to the other aspect of the cause of conjunctivitis which has recently been exciting attention—*virus infection*. Considerable interest was aroused by the isolation by Noguchi in 1925 of a bacillus which he named *B. granulosis* from trachoma in North American Indians. He claimed that it produced characteristic and progressive lesions in chimpanzees and rhesus monkeys. This organism has not, however, been constantly found by other investigators. Initially his findings were substantiated by his associates at the Rockefeller Institute in New York (Tyler, 1929; Tyler and Olitsky, 1930; Tilden and Tyler, 1930; Olitsky, Knutti, and Tyler, 1931-2); by Stéphanowa and Azarowa (1929) in the Ukraine; by Finnoff and Thygeson (1929) in America; and by Weiss (1929) and Lumbroso (1930) in North Africa. Soon, however, contradictory evidence began to appear. In the first place it was pointed out that the spontaneous recovery of Noguchi's monkeys without cicatrization suggested that they were suffering from folliculosis and not trachoma (Lindner, 1929; Cucco, 1930; Reiger, 1932; and others). Secondly, a search for *B. granulosis* by other investigators in cases of trachoma has been more often negative than positive (Wilson, 1928; Morax, 1929; Bengston, 1932; Howard, 1933). And, finally, attempts to produce a trachoma-like conjunctivitis with *B. granulosis* have been rarely successful (Addario, 1930-1; Proctor, 1931-2), and much more frequently abortive both in human beings and in monkeys even when material sent from Noguchi's laboratory was employed (Wilson, 1929, in Egypt; Morax, 1929, in France; Brückner, 1929, in central Europe; Mayou and others, 1930, in England; Weiss, 1929, and Thygeson, 1933, in the United States; and many others). Up to the present time no micro-organism has been obtained in pure culture which can be constantly and exclusively found in trachomatous lesions and which is capable of producing in man or animals the characteristics of the disease.

The failure to find a micro-organism led naturally to the search for a filtrable virus. Early attempts to transmit the disease by filtered material were unsuccessful; positive results in monkeys have been reported, but it is questionable if a true trachoma resulted. It would appear, therefore, that a virus *per se* is not involved, although the findings of Thygeson (1934), to be spoken of

presently, wherein positive inoculations were obtained with a filtrate through a filter of 0.7 microns, indicate that a virus associated with or represented by minute bodies may be present.

Considerable interest has thus been aroused in the Prowazek-Halberstaedter body, an inclusion in epithelial cells of trachomatous conjunctivæ, which was discovered by these two workers in Java in the year 1906. In its fully developed state it consists of a vacuole filled by a vast number of granules, the elementary granules, each about  $\frac{1}{2} \mu$  in diameter. The early stages of this inclusion are called initial bodies. They may be free or intracellular. The former, as described by Lindner, cannot be distinguished morphologically from polar-staining bacilli such as *Pasteurella avicida*. The latter take various shapes resembling cocci, bacilli, etc. The initial bodies, both free and intracellular, stain dark blue, and the elementary granules stain purple with Giemsa. These inclusions can be demonstrated in a varying percentage of trachoma cases, different authors claiming from 40 to 100 per cent; they are also found with considerable regularity in inclusion blennorrhœa of the new-born, and swimming-bath conjunctivitis. Their micro-organismal nature has been strenuously denied by many writers, who have considered them variously disintegrated bacteria (Herzog, 1910; McKee, 1911-35; Williams, 1914; Bengsten, 1929; Stewart, 1933; and others), intracellular changes resulting from the activity of a virus (Lumbroso, 1933-4), or non-specific reaction products (Gifford and Lazar, 1930). Others have maintained their organismal nature (Lindner, 1911-35; Howard, 1934; Thygeson, 1934). It is quite impossible to judge of this on morphological grounds; but biological evidence of considerable value in favour of this latter view in a kindred disease was furnished by Thygeson (1934), who produced a non-trachomatous blennorrhœa in the human and a folliculosis in monkeys (Thygeson and Proctor, 1935), using for inoculation material which had been passed through a filter fine enough to exclude bacteria but coarse enough to allow the passage of initial corpuscles. At the present time we must admit that the organismal cause of trachoma is unknown; the absence of specific bacteria suggests a virus; and the most recent work suggests that this virus may be associated with intracellular inclusions.

*Swimming-bath conjunctivitis* is a type of follicular conjunctivitis caused by a filter-passing virus, of slow onset and leisurely clinical course, characterized by considerable hyperemia, slight discharge, and pre-auricular adenopathy, and ending in resolution; frequently the epithelium contains intracellular inclusions. Its occurrence in epidemic form is an observation of considerable age, and in addition to its well-known incidence among the habitués of swimming-pools, it has been observed in quite a number of circumstances in which people were brought into intimate contact—in schools, asylums, orphanages, and regiments of soldiers. Originally considered a mild type of trachoma, it was established as a clinical entity by Fehr (1900); Paderstein (1913), being brought into contact with some cases, found intracellular inclusions in the epithelium similar to those described by Halberstaedter and Prowazek, and already associated with trachoma; inoculating a monkey's conjunctiva with these, Hunttemüller and Paderstein (1913) produced a similar follicular lesion. Shortly before this, similar inclusion bodies had been discovered in cases of ophthalmia neonatorum (Stargardt, 1909; Heymann, 1909; and others); and Lindner (1909) in extensive investigations associated their presence with a type of ophthalmia in which neither gonococci nor other virulent organisms were found, and which he termed *inclusion blennorrhœa*; he was also able to transfer the disease to monkeys. The following year Wolfrum (1910) inoculated an adult with the secretion from an infant with inclusion blennorrhœa and produced a follicular conjunctivitis, which, despite its benign course, he considered

as an attenuated trachoma. In the meantime Fritsch, Hofstaeter, and Lindner (1910) had found similar intracellular inclusions in the urethra of cases with a mild non-gonococcal urethritis, and injecting this material into monkeys, produced a follicular conjunctivitis; Lindner (1911) therefore put forward the theory that inclusion blennorrhœa was a 'genital trachoma', a mild form of the disease contracted from contact with the urethral discharge of the mother—an identity, however, immediately denied by Löhlein (1913), Gebb (1914), and others.

After the war the question was again taken up by Engleking (1921), who confirmed Paderstein's discovery of inclusions in swimming-bath conjunctivitis, listing the disease as a genital infection. It is of importance that inclusion bodies have now been found in the urethra of both sexes and in the vagina (Hamburger, 1934; Thygeson, 1935), associated with some discharge, although they have not received attention in gynaecological literature. The theory of an attenuated genital trachoma was again taken up by Lindner (1925-35) and Aust (1926-30), the latter consolidating his position by observing an inclusion blennorrhœa in the baby of a woman who had a swimming-bath conjunctivitis. These, and confirmatory observations and experiments of others (Morax, 1933; and others), leave no doubt that the two types of conjunctivitis are the same—inclusion blennorrhœa of the new-born and swimming-bath conjunctivitis, for it has been demonstrated that inoculation of the adult with the conjunctival secretion of the infant produces a condition identical with swimming-bath conjunctivitis, and inoculation of the monkey with either produces a follicular conjunctivitis clinically and experimentally identical. Moreover, that the infection is a virus has been fully demonstrated, since inoculations have been successfully carried out by emulsified conjunctival scrapings passed through the finest Berkefeld filter. The virus itself has a considerable virility, retaining its virulence after dilution and keeping at room temperature for several days (Morax, 1933).

At the present moment other problems in the etiology cannot be dogmatically settled. That the disease is an attenuated 'genital trachoma' seems most unlikely; the sum of experimental evidence is against this view, and the clinical evolution of cases is very conclusive. Lindner's (1935) suggestion that inclusion blennorrhœa of the new-born and swimming-bath conjunctivitis are *para-trachoma*, corresponding to paratyphoid in relation to typhoid fever, caused by the same organism as trachoma which has been modified to assume different and attenuated characteristics in its habitat in the genital tract, must also remain an open question until further evidence is forthcoming. We have already seen that the intracellular inclusions are considered by some to be the actual infective agent; by others to be specific cellular changes resulting from its activity; and by others to be non-specific reaction products. It seems that they have some specificity; but the difficulties of drawing conclusions as to the nature of minute particles on the border-line of visibility are so great at present that the only safe position to take up is one of scepticism. It is significant that in swimming-bath conjunctivitis inclusions have not invariably been found even in swimming-bath infections—Rohrschneider (1926) found them 15 times in 22 cases; Foder (1927) 24 in 28; Aust (1930) 4 times in 31 cases; Morax (1933) 2 in 19. In non-swimming-bath infections Morax (1933) found them 3 times in 10 cases, and Pillat (1926), in an epidemic in an asylum, 35 times in 38 cases. To justify his position Lindner (1935) postulates two types of swimming-bath conjunctivitis—one with and one without inclusion bodies; but since no clinical differentiation is possible, this position seems indefensible until it is founded on experimental evidence, which has not yet been furnished.

**Pre-operative Preparation of the Conjunctival Sac.**—It is a commonplace fact to all ophthalmic surgeons that frequently very considerable delay and uneasiness to the patient is caused by the necessity of performing a cataract operation in the presence of a dirty conjunctival swab; and particularly is this so when a *St. aureus* has got deeply seated in the mucous membrane. In some of these cases constant treatment by lotions, and even silver, seems to be unable to eradicate the micro-organism. The technique of local radiation of the conjunctiva by *ultra-violet light* suggested by Law (1934) provides a way out of the difficulty. The apparatus used is the modified general phototherapy mercury-vapour lamp. It consists essentially of a lamp mounted on a movable stand in front of a hemispherical housing, over the aperture of which is fixed a flat aluminium disc, pierced in the centre by a director tube. The patient's head is secured in the usual form of chin- and head-rest, and the lids are everted, and held so as completely to cover the cornea. Though this may sound at once crude in idea and uncomfortable in execution, it is nevertheless quite comfortable for the patient, and satisfactory in practice.

The routine adopted is to give six doses of five minutes each at two-day intervals, irradiation being carried out at a distance of about 12 in.; the number of doses is increased if necessary. His paper may be summarized in the following conclusions: (1) Ultra-violet irradiation is successful in nearly every case in rendering the eye bacteriologically safe for operation, even when the other methods fail. (2) The pathogenic organisms appear to be more susceptible to the rays than the non-pathogenic, as evidenced by the infrequency of a resultant sterile culture. (3) Some results suggest that the pathogenic organisms are only temporarily attenuated or inhibited, but that when this has been achieved operation may be safely undertaken. (4) It is inadvisable to combine with this treatment the use of antiseptic lotions, and silver, as the eye appears to be intolerant of such vigorous measures.

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**CORNEA, DISEASES OF.***Sir Stewart Duke-Elder, M.D., F.R.C.S.*

**Corneal Opacities.**—E. Selinger<sup>1</sup> reports interesting results in the treatment of corneal opacities by *quinine* in the form of 2 per cent quinine bisulphate ointment. In cases of interstitial keratitis, while it is generally agreed that the course of the disease cannot be affected by antisymphilitic therapy, local therapy in the form of atropine, hot dressings, dark glasses, and other means of treatment is directed chiefly at the control of the accompanying inflammation of the iris, ciliary body, and anterior portion of the choroid, and to prevent, if possible, the development of complications.

In three cases of bilateral active disease which were receiving antisymphilitic treatment, quinine was given locally, and rapid subjective improvement was noted after a few days, so that the photophobia and blepharospasm, which were excessive before the use of the quinine ointment, were markedly diminished within a few days and the patients were able to keep their eyes open. Changes in the appearance of the corneal opacities were also observed. Old infiltrates became less dense and in some places disappeared entirely within from one to two weeks, while fresh corneal opacities, but of comparatively less density, made their appearance in other places from time to time. The appearance then was that of shifting deep corneal infiltration. No change was seen in the appearance of the newly formed corneal vessels. The entire course of the disease seemed to be milder and shorter. Selinger considers that the beneficial effect of quinine in cases of interstitial keratitis is probably the result of several factors. The slight anæsthetic effect of the quinine on the cornea may, in part, account for the rapid subjective improvement. Part of the subjective improvement, however, may be a result of the decrease in the severity of the inflammation. That the quinine has an effect on the accumulation of lymphocytes and other abnormal cells in the deep layers of the stroma is seen from the fact that the opacities are observed to change in density, and that some of the older infiltrates disappear entirely in places within a few days, while fresh, less dense infiltrates make their appearance from time to time. It is known that ordinarily corneal infiltrates, once developed, become denser and denser, and remain for from many weeks to many months before they finally become absorbed. The rapid change in the character of the infiltrate can be ascribed only to the action of the quinine on the cellular elements making up the infiltrates. One of the three patients treated with the quinine bisulphate ointment showed improvement in central vision from 0.1 to 0.4 within seven days and to 0.8 within thirty days, although the inflammation continued for five more weeks. There had been no change in the medication, apart from the addition of the 2 per cent quinine bisulphate ointment.

Equally interesting observations were made in cases of old corneal opacities after the use of 2 per cent quinine bisulphate ointment twice a day. Among seven eyes in four patients with old corneal opacities as a result of syphilitic interstitial keratitis, the condition was of twenty-four months' duration or longer in four, of eight months' duration in two, and of five months' duration in one. These patients had been treated with ethylmorphine hydrochloride powder, 2 and 3 per cent yellow mercuric oxide ointment, and hot dressings for varying lengths of time, with no changes in the appearance of the opacities and no improvement of vision. All other medication was discontinued when the treatment with the quinine was instituted. Within from two to six weeks most of the patients showed definite improvement of vision and a noticeable decrease in the density of the opacities. In one patient who had a dense central opacity of two years' duration, visual acuity of 0.4 improved 0.8 after four weeks of local quinine therapy. There was still a great deal of clouding of the cornea left, but the centre of the pupillary area had cleared sufficiently to

increase the visual acuity to that extent. In another patient, with a three-year-old very faint central opacity, vision showed an improvement from 0.8 to 1.0, while in a third patient vision, which was only 0.2 as a result of an eighteen-month-old dense central opacity, improved to 0.4. In some other cases there were extremely dense opacities, and although there was no measurable increase in the visual acuity there was a definite decrease in the density of the opacities, and the patients stated that objects appeared considerably brighter to them than before the treatment.

Three other patients had corneal opacities as a result of corneal ulceration. In one the condition was of three months', in another of eight months', and in the third of twelve months' duration. In the first patient visual acuity improved from 0.1 to 0.3, and in the second patient from 0.4 to 0.6, after three weeks of quinine therapy. The third patient had a very dense central opacity measuring about 6 mm. in diameter, which seemed to become less dense, but there was no improvement in visual acuity.

It is probably true that some of the opacities would have cleared up to a certain extent with other forms of therapy, or even spontaneously, but the comparatively rapid improvement with the quinine therapy is striking. A slight improvement in visual acuity or even improvement in the cosmetic appearance makes it desirable to attempt any form of treatment that seems free from danger. Proper evaluation of the therapeutic action of a new drug can be obtained only after a sufficiently large number of patients have been treated over a long period of time, and confirmation or otherwise of this report will be of interest. It is to be noted that the following drugs are among the antagonists and incompatibles of quinine, and for that reason should not be used while the patients are being treated with quinine: copper, lead, zinc, mercury, and their compounds, ammonia, alkalis, iodides and bromides and their salts, tannic acid, and lime water.

**Keratitis Bullosa.**—Keratitis bullosa is an uncommon condition. It is generally agreed that it is an intractable disease resisting the usual forms of treatment, and resulting either in considerable impairment of vision or destruction of the eye.

The characteristic symptoms are recurrent attacks of severe pain, irritation, and photophobia, together with the formation of one or more large blebs which recur at intervals over an indefinite period. These blebs rupture, leaving an abraded area. Constant repetition of the blebs with the attendant inflammation causes scarring of the cornea and impairment or loss of the vision, or destruction of the eye. For purposes of description bullous keratitis may be described as:—

1. *Primary.*—Occurring spontaneously in an apparently healthy individual with no history of trauma. During the course of the disease the intra-ocular pressure may be increased. This is the form with which we are concerned at this time.

2. *Secondary.*—

a. *Traumatic.* (i) Abrasion of the corneal epithelium: traumatic relapsing keratitis. (ii) Intra-ocular foreign body with iridocyclitis, increased intra-ocular pressure, panophthalmitis, or phthisis bulbi.

b. In association with glaucoma and iridocyclitis.

c. *Dystrophic*—pannus degenerativus of Fuchs.

The exact mode of the production of the blebs is not certainly known.

The disease runs a chronic course. For years there will be recurrent attacks of pain, so severe that the patient may request enucleation. The vision is gradually and seriously impaired; it seems fortunate that any vision is retained after so much disturbance of the corneal tissue. If glaucoma does not already exist, the intra-ocular pressure usually becomes elevated.

**TREATMENT.**—The treatment so far practised consists in relieving the symptoms, removal of the bleb, and prevention of its recurrence and of complications. Holocaine seems to have been used chiefly to relieve the pain; for obvious reasons cocaine is contra-indicated. Dionin and atropine have been used in the early stages with a pressure bandage, with pilocarpine or iridectomy if the tension becomes increased. Because of the periodicity quinine has been tried. After removal of the bleb the base is touched with tincture of iodine or silver nitrate. In one case reported by Gala (1925) removal of the superior cervical sympathetic ganglion effected a cure. If these measures fail, enucleation may have to be done to relieve the pain, or if panophthalmitis develops as the result of perforating ulcer. Enucleation also seems to prevent a sympathetic-like similar condition in the other eye. Hence the prognosis either as to vision or saving the eye is poor.

Considerable interest therefore attaches to the report of a case by W. T. Davis<sup>2</sup> in which a cure was effected by the use of *X rays*. The case was a typical and severe one in a woman 61 years of age in whom the disease had been present over a year. There was intense photophobia and blepharospasm, so marked that it was impossible for her to extend her head or to open her eyes. The pain was almost continual and completely incapacitated her for any duties. The treatment adopted was as follows:—

**Left Eye.**—Roentgen therapy was begun July 18, 1931, and concluded Jan. 18, 1932. Total number of treatments, 13. Dosage factors: 5 milliamperes, 140 kilovolts, 10-in. distance, 5 mm. aluminium filter, time of exposure 2½ minutes. This equals 90 international units, or about one-third of the amount required to produce a mild erythema of the skin. The minimum interval between treatments was one week. The lids were kept open as much as possible and the surrounding skin was protected by a lead shield.

Some improvement began in the left eye after the first two or three treatments. Since the fifth treatment on Aug. 28, 1931, the eye has caused her practically no discomfort.

**Right Eye.**—Roentgen therapy was begun Aug. 1, 1931, and concluded June 3, 1932. The total number of treatments was 18, the technique being the same as that employed for the left eye, except that for the last four treatments the dosage was reduced 50 per cent.

On the whole the response to treatment was not quite as satisfactory as that of the left eye. After the thirteenth treatment on March 1, 1932, there was considerable redness and swelling of the conjunctiva, which developed shortly after an operation; possibly the operation and roentgen therapy were joint factors in causing this. It proved annoying for two or three months, but the patient is reported as having been practically symptom-free for the past six months.

**REFERENCES.**—<sup>1</sup>*Arch. of Ophthalmol.* 1935, xiii, 829; <sup>2</sup>*Amer. Jour. Ophthalmol.* 1934, xvii, 24.

## **CORONARY ARTERY DISEASE.** (*See also* ANGINA PECTORIS.)

*A. G. Gibson, M.D., F.R.C.P.*

In a discussion at the Royal Society of Medicine<sup>1</sup> on the *ultimate prognosis* of coronary occlusion John Hay remarked that 50 per cent of patients recover immediately. Of the survivors he makes two groups: (1) Those in whom the immediate attack is followed by an increasing tendency to dyspnoea and a drift towards congestive failure. Pain is not a dominant feature, but there is orthopnoea, Cheyne-Stokes respiration, and later pulmonary oedema and anasarca. In these the outlook is uniformly bad from the start, and they seldom live more than a few months. (2) Those in the second group make a satisfactory



recovery and are able to lead useful lives. They are rarely free from some form of distress, usually anginal pains of effort. The length of life in these patients is measured in years. Some of them—c.g., one recorded by White—lived for seventeen years. Of the other factors that influence prognosis, the younger the onset the greater is the tendency to recover completely from the thrombosis. The blood-pressure has little influence, but the more serious condition appears to be a diminishing blood-pressure. A diminishing pulse-pressure, however, often indicates the beginnings of cardiac failure. The electrocardiogram is of great value in the diagnosis but seldom aids in the prognosis. The presence of anginal features does not appear to alter the outlook.

T. F. Cotton emphasized the importance of earlier attacks of occlusion, which could be ascertained by a careful history. Auricular fibrillation, paroxysmal tachycardia, and heart-block are sometimes the direct consequence of coronary thrombosis.

B. T. Parsons Smith was inclined to put the cases immediately fatal rather higher than 50 per cent, and stressed the importance of a careful investigation of the circulatory efficiency and its reserve capacity in an estimate of prognosis.

Sir Maurice Cassidy stressed the importance of the intercurrent infective factor in the production of coronary occlusion from thrombosis; pyrexia and leucocytosis were evidence of this infection. Anginal symptoms may be relieved by the removal of infective foci such as dental sepsis. The prognosis should not be unduly darkened by an abnormal electrocardiogram. Some patients are symptomless for years after a coronary occlusion despite gross electrocardiographic changes.

D. E. Bedford placed the mortality during the acute attack at not more than 25 per cent—that is, that a patient seen alive with coronary thrombosis has a 3 to 1 chance in favour of recovery.

The difficulties in *distinguishing abdominal disease from coronary occlusion* are referred to by P. S. Barker, F. N. Wilson, and F. A. Collier,<sup>2</sup> and four cases are reported. In two the symptoms were caused by gall-bladder disease though a diagnosis of coronary disease had been made. A third had a perforation of a gastric ulcer, and in a fourth both cholelithiasis and coronary disease were present. In the second patient, one with gall-bladder disease, relief of the symptoms was obtained by inhalation of amyl nitrite. This suggested that the relief was obtained by the relaxation of spasm at the pylorus or in the biliary tract. In neither of the first two patients was there any alteration of the electrocardiogram.

H. B. Sprague and E. S. Orgain<sup>3</sup> remark that it has fairly well been agreed from the work of Barnes and Whitten, Parkinson and Bedford, and Wilson, that an infarct of the anterior and apical portions of the heart produces *electrocardiographic changes* of the  $T_1$  type in which a high origin and later an inversion of the T wave in Lead I is associated with a low origin and positive deflection in Lead III. Infarction of the posterior or diaphragmatic region of the left ventricle results in the  $T_2$  type of curve in which the high origin and late inversion are found in the T wave in Lead III. A study of the post-mortem evidence as compared with the electrocardiographic in coronary thrombosis suggests caution in too much insistence upon typical tracings of acute coronary occlusion for accurate diagnosis of the lesion. Of 61 cases analysed, 46 showed an affection of the left coronary system and 21 of the right. It is seldom that in post-mortems the thrombosis is confined wholly to the left or right coronary arteries. Only 7 cases were found to be purely affections of one artery. In this group the QRST complex is most typical whether in Lead I or Lead III. It is remarked that inversion of the T waves alone may be seen in all leads in pericarditis, rheumatic carditis, uremia, and in rare unexplained cardiac disease in which the

coronary system may be normal at post-mortem. When limited to the tip of the apex and anterior wall of the left ventricle the localization of the infarct was accurate in 70 per cent, but only 30 per cent were correct as to the posterior or diaphragmatic infarcts. They say also that high degrees of coronary thrombosis with fresh infarction can occur with normal electrocardiograms. In the cases with healed coronary thrombosis with symptoms of angina pectoris, cardiac asthma, and congestive failure in which the diagnosis had not been made till the post-mortem, only 8 out of 28 cases had electrocardiograms characteristic of either anterior or posterior cardiac infarct, but it is stated on the evidence submitted that had serial electrocardiograms been taken for several years before death, the position of some of these infarcts might have been deduced. In 44 cases showing old coronary occlusion with or without a fresh coronary blockage the electrocardiogram was diagnostic for cardiac infarct in 38 per cent.

W. B. Cooksey,<sup>4</sup> following up the *after-histories* of 53 patients with coronary thrombosis in private practice, found a mortality of 39.6 per cent. Of the living patients 78.1 per cent were restored to their previous occupation. One patient was living thirteen years after an acute infarction and 10 were living six years after. The mortality of coronary thrombosis is greater after than before 60.

E. F. Horine and M. M. Weiss<sup>5</sup> studied the effect of coronary thrombosis in 20 patients whose hearts were not enlarged before the event, and the coronary thrombosis as estimated by X rays did not induce cardiac enlargement. This would coincide with anatomical evidence, in which completely healed coronary thrombosis and much thinning of the heart wall may be found with no evidence of hypertrophy.

H. A. Salzmänn<sup>6</sup> describes 5 cases of *rupture of the heart* and collects a series of 114 cases. The greater number of these are the result of coronary sclerosis, but occasionally rupture is caused by aneurysms, fatty heart, myomalacia, or pyæmic abscesses. The greatest number occurred between the ages of 70 and 80, and the site of predilection is the apical region of the left ventricle. Diagnosis is always a difficult matter, and in the 5 cases personally attended the correct diagnosis was not made in any. One of these was operated on because of abdominal symptoms. These symptoms are easily confused with those following pancreatic necrosis, cholelithiasis, and nephrolithiasis. The important fact in the clinical history is that rupture may follow cardiac infarction at an interval of from five to fifteen days.

A. L. Barach and R. L. Levy<sup>7</sup> give an account of the treatment of coronary occlusion by *oxygen inhalations*. The method of choice is an oxygen chamber, and in Great Britain Poulton's oxygen chamber would be the method preferred. They recommend a percentage of oxygen of about 38 and a flow from the chamber of 7 to 8 litres per minute. They have noted great subjective improvement in from one to three hours after administration had begun. Pain was relieved and respiration became slower and less laboured. Cyanosis was diminished. Cheyne-Stokes respiration disappeared, and the heart-rate became slower.

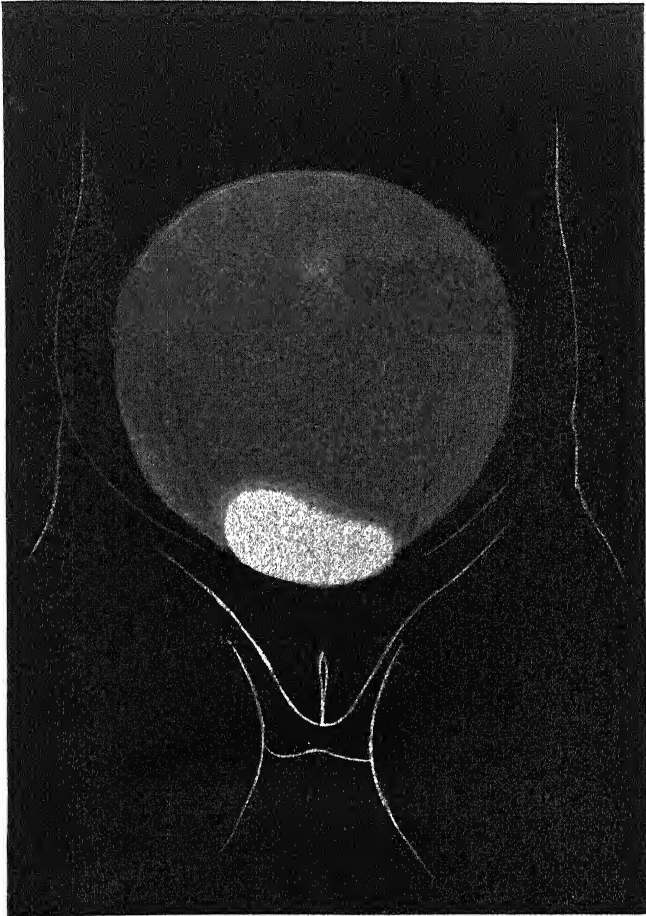
G. Bickel, J. Mozer, and F. Sciclounoff<sup>8</sup> found that in myocardial infarction the *sedimentation rate* of the red cells increased rapidly for about two or three days after infarction and reached its maximum three or four days after. The curve of the sedimentation rate from day to day did not correspond closely with the fever and leucocytosis. It is probably related to the alterations in the fibrinogen content of the blood.

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## PLATE XXII

### CYSTO-DIAPHANOSCOPY

(R. KLAFTEX)



Cysto-diaphanoscopy of a large simple ovarian cystoma. The ovarian tumour reaching upwards beyond the umbilicus is completely illuminated. Between the tumour and the lateral abdominal wall a small dark interspace is present. Above the symphysis pubis appears the more strongly lighted bladder, compressed in part by the tumour.

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'Journal of Obstetrics and Gynaecology of the British Empire'*

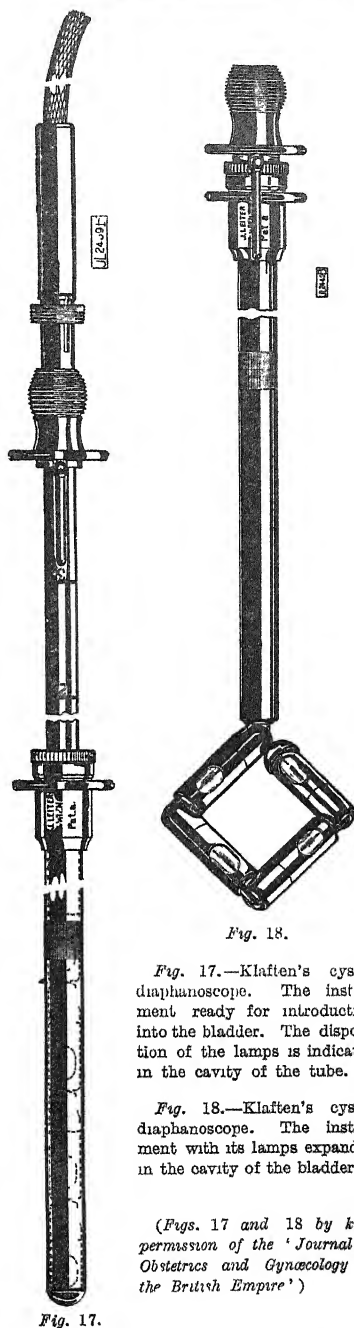


**CRETINISM.** (*See THYROID GLAND.*)**CYSTO-DIAPHANOSCOPY AS AN AID TO GYNÆCOLOGICAL DIAGNOSIS.**

*Beckwith Whitehouse, M.S.,  
F.R.C.S., F.C.O.G.*

The application of the principle of utilizing electrical illumination of the bladder as a luminous source for visualizing certain of the contents of the abdominal cavity has recently been described by E. Klapfen,<sup>1</sup> of Vienna. By means of an ingenious arrangement of multiple lamps carried in an apparatus based upon the principle of a cystoscope, the author has found it possible to transilluminate the bladder so intensely that light is transmitted in a dark-room through the abdominal wall. The distribution of the translucent areas can be utilized in the differential diagnosis of various abdominal and abdomino-pelvic lesions. The method is simple and is carried out as follows: The bladder is washed out with a solution of 3 per cent boric acid and 250 to 300 c.c. are retained within the organ. After disinfection of the urethral orifice, the end of the cysto-diaphanoscope, lubricated with glycerin, is introduced with care into the bladder. The instrument is then steadied, and by means of a 'pin' the lamps are expanded into the distended bladder. The cysto-diaphanoscope, obtainable from Messrs. J. Leiter, Vienna LX, Mariannegasse 11, is shown closed and open in *Figs. 17 and 18*.

Although in many instances the use of this method for diagnosis would be unnecessary and superfluous, cases occur from time to time where, for purposes of fine diagnosis, cysto-diaphanoscopy would appear to have an application. The appearance exhibited in the dark-room in the case of a translucent ovarian cystoma is well shown in *Plate XXII*. When a cyst is known to be present additional information can be obtained upon the nature of its contents by transillumination. Thus the contents of serous and pseudomucinous cysts are translucent in varying degree, but the admixture of blood renders the tumour opaque. Large



*Fig. 18.*

*Fig. 17.*—Klapfen's cysto-diaphanoscope. The instrument ready for introduction into the bladder. The disposition of the lamps is indicated in the cavity of the tube.

*Fig. 18.*—Klapfen's cysto-diaphanoscope. The instrument with its lamps expanded in the cavity of the bladder.

(*Figs. 17 and 18 by kind permission of the 'Journal of Obstetrics and Gynaecology of the British Empire'*)

*Fig. 17.*

lax ovarian cysts, especially if complicating labour, large parovarian cystomata, ascites under tension, e.g., tuberculous, and uterine cystic fibroids complicated by ovarian cystomata—all on occasion introduce difficulties of diagnosis, and in such cases absolute diagnosis is only possible, in the opinion of Klaften, by means of diaphanoscopic examination.

REFERENCE.—<sup>1</sup>*Jour. Obst. and Gynæcol. Brit. Emp.* 1934, xli, Oct., 739.

## DEAFNESS.

F. W. Walkyn-Thomas, F.R.C.S.

### Social Aspects of Deafness.—

*Deafness in Automobile Drivers.*—H. Burger<sup>1</sup> discusses this subject from the point of view of driving ability. In 1933 the Swiss Society of Otolology and Laryngology accepted by a large majority recommendations formulated by Ulrich which laid down definite degrees of hearing capacity as requisite for various groups of drivers. Some speakers demanded normal hearing, which, according to Bezold, would exclude one person in three. In Germany it is required that the conversational voice be heard at 5 metres distance. On the other hand, deaf people with paracusis Willisii seem to hear better in traffic than do normal people, and some deaf people claim not only that deafness causes no accidents, but that the deaf driver, undisturbed by the uproar around him, happily oblivious of the exhibitionist hooting of the ill-mannered and the incompetent, finds driving all the safer and easier; they remark also that the prohibition of horn-blowing at night in some counties has actually diminished the number of accidents. Burger believes that it is a mistake to lay down rigid rules. They can only be based on: (1) Ability to localize sound; (2) A certain degree of acuteness of hearing. As to sound localization, it has been proved that in a noisy street even those with normal hearing cannot accurately localize sound. As to the degree of acuteness of hearing, the mentality of the driver is far more important; if the deaf person is active and alert, he is much more likely to be competent than a man who is less deaf, but slow and dull. It is a common observation that one deaf child will do well in an ordinary school, while another, who hears equally well, has to be sent to a special school for the deaf. Burger agrees with Ulrich, however, that deaf people should not drive public vehicles, and, in view of possible future legislation, advises the deaf not to choose driving as a profession.

*Eugenics and Deafness.*—In Germany between March and May, 1934, the first special Eugenic Court<sup>2</sup> ordered sterilization in 325 cases; in two of these cases sterilization was ordered on account of constitutional sporadic deaf-mutism. M. Schwarz<sup>3</sup> advocates not only compulsory sterilization of the true congenital deaf-mutes, but also prohibition of marriage among closely related persons carrying the hereditary taint (the heterozygous relatives, in the Mendelian terminology). Voluntary sterilization of otosclerotics is apparently possible under the law.

*Ear Disease as a Menace to Life, with Particular Reference to Life Insurance.*—T. Guthrie<sup>4</sup> discusses this subject and states that deafness without suppuration is not itself dangerous to life, but in modern traffic it certainly constitutes an added risk; this is specially the case in such occupations as road-making and railway work. Further, it must be remembered that some deafness is steadily progressive, and a young person who is already rather deaf may become very deaf indeed in middle life. Vertigo not associated with suppuration is again a condition not in itself dangerous, but liable to be a source of danger in traffic or in any occupation where there is need for the victim to work on heights.

The risk to life specific to the condition is limited to aural suppuration, and here Guthrie's conclusions must be quoted *in extenso* :—

"In conclusion, candidates for life insurance who suffer or have suffered from suppurative middle-ear disease may usefully be divided into the following four classes:—

"1. Those who have had one acute attack followed by closure of the perforation and complete recovery of the hearing. These may be accepted as first-class lives as far as the ear condition is concerned.

"2. A history of two or three mild attacks at long intervals with complete healing of the perforation between the attacks need not prevent acceptance with some addition, say, 10 to 20 per cent, to the premium. The amount of the addition in a case of this kind would be especially small if some condition such, for example, as adenoids, likely to predispose to a repetition of the attacks, were found to be present and were removed.

"3. Those with a permanent central or anterior perforation in whom at long intervals re-infection takes place, either via the Eustachian tube during 'colds' or as a result of water entering the meatus and reaching the middle-ear through the perforation. If in such cases the discharge is unaccompanied by other symptoms and ceases in a few days, so that the ear again becomes dry and free from any signs of active disease, acceptance with an addition of 25 per cent to the premium may be regarded as safe.

"4. All others should be refused, at least until they have undergone a radical or modified radical mastoid operation. On the other hand, after an operation of this kind, a candidate may be accepted with or without a slight addition for the loss of hearing if (a) there has been freedom for six months from all ear symptoms, such as pain, headache and vertigo; (b) the ear has been completely dry for at least six months, or, everything else being satisfactory, only a trace of moisture is present about the tympanic end of the Eustachian tube; (c) the cavity is widely open to inspection through the enlarged meatus, is covered with healthy skin, and free from granulations or adhesions behind which pockets might form containing scales and secretion; and (d) the cochlear and static portions of the labyrinth are proved to be healthy by the presence of normal bone conduction and normal responses to the vestibular tests."

[The only criticism we have to offer is that in group 3 a 25 per cent load seems heavy for anterior perforations with Eustachian recurrence. As a rule this condition, although destructive to hearing, implies little or no risk to life.—R. W. W.-T.]

#### Otosclerosis.—

ETIOLOGY.—A. A. Gray<sup>5</sup> believes that the causation of otosclerosis depends on the failure of the vasomotor system of the hearing organ. It may be assumed that the normal vasomotor response of the ear will be in response to sound, the normal stimulus. If this vasomotor response fails, there will be insufficient blood-supply to the bone around the foot-piece of the stapes when it is put under increased stress by the vibration of the stapes. This under-nourished bone undergoes change, but for some time the change remains localized around the oval window. Similarly the changes in the auditory nerve can be explained as a degeneration due to malnutrition. This would account for some of the peculiarities of the disease, e.g., the temporary improvement in hearing following inhalation of amyl nitrite, the occurrence of tinnitus before deafness, the occasional disproportion between the degree of deafness and the pathological signs found post mortem, the symmetrical distribution, and the greater frequency of the condition in women with their less stable vasomotor system and the greater strain (menstruation and pregnancy) to which it is exposed. [It would also account for the immunity of the vestibular apparatus, the atrophy of the tympanic membrane, and the changes in the skin of the meatus, such as loss of wax-secretion and diminution of sensibility, which are common in

otosclerosis. But it does not account for the frequency with which we find osteomata of the meatus in otosclerosis or for the changes in the bony capsule of the canals, which have been demonstrated radiologically by Graham Hodgson.—F. W. W.-T.]

TREATMENT.—Gray<sup>6</sup> has now attempted to apply these ideas in the treatment of otosclerosis. He noticed that thyroid extract applied to the nasal mucous membrane caused active vascular congestion of long duration without any inflammation. If otosclerosis is the result of defective vasomotor response in the vessels of the ear, thyroid extract might overcome this by setting up congestion. Accordingly he has injected *thyroxine* into the tympanic cavity in a series of 14 otosclerotic patients, with improvement in 7 cases. The method is to inject  $\frac{1}{10}$  gr. dissolved in 4 min. of water through the postero-inferior segment of the tympanic membrane with a fine needle after the membrane has been anaesthetized with 10 per cent cocaine hydrochloride in aniline. Only in one case was there any inflammatory reaction, and here the patient had poured into his ear a dose of radiostoleum instead of swallowing it. There was no other untoward incident. If improvement is obtained it seems to last for several weeks. [More work is being done on the method, and we may hope for further evidence in the course of the year. Encouraging though these results are, we must remember that the interest in a new treatment, and above all a treatment which seems to improve the general condition, always produces a temporary good result in otosclerotics.—F. W. W.-T.]

H. Rollin<sup>7</sup> reports results of an operation for the arrest of otosclerosis based on the work of Wittmaack. Some years ago Wittmaack suggested that otosclerosis was caused by congestion in the veins draining the labyrinth capsule. On this supposition Rollin endeavours to terminate the congestion by dividing the veins which penetrate the tegmen tympani. The veins are divided in the hiatus Fallopii, where they accompany the great superficial petrosal nerve. They are reached by trephining the squamous temporal and elevating the dura from the floor of the middle fossa. Rollin has performed the operation on 17 ears, and only in 1 has there been any increase in deafness since the operation was done. In 2 ears there has been improvement in hearing, and in nearly all there has been relief or cure of tinnitus.

[At the time of the report no patient had been under observation for more than eighteen months after the operation, and this is too short a time for us to form any accurate estimate of the value of the method. Wittmaack's view has not been generally accepted by pathologists. If it is true that tinnitus can be alleviated by the operation, we may have a valuable addition to our resources; but it must be remembered that this is an operation of some severity. The hiatus Fallopii can be reached only through a large opening in the cranial wall, and adequate exposure entails considerable manipulation of the brain.—F. W. W.-T.]

**Corrective Measures for Progressive Deafness.**—Gordon Berry<sup>8</sup> believes that progressive deafness starts in adolescence, if not in childhood. When the causes of relapsing Eustachian catarrh have been removed and septic foci eliminated, the conscientious otologist is too apt to think that he has done all that is possible. On the contrary, this is just the time when his help is most needed. He can best advise on the three 'corrective helps': lip-reading, mechanical hearing aids, and psychological rehabilitation. A difficulty in lip-reading is that new pathways in the brain must be formed, as the speech centres have to be coupled with the sight centres in place of the auditory centres. The educated adult, with well-formed auditory-speech pathways, often finds it harder to learn lip-reading than does the child or the ignorant adult. Berry concludes his paper with nine rules, thus:—



## NINE COMMANDMENTS FOR THE HARD OF HEARING.

1. Thou shalt frankly confess thy deafness to thyself and before thy fellow men. Let there be no deceit nor false pride.
2. Thou shalt not covet thy neighbour's hearing, but shalt rejoice that thou livest in an age when thy handicap can be made so small.
3. Early and again shalt thou consult thy otologist and accept every scientific aid he can render.
4. Eschew the quack and his devices. Easy and broad is the way to his door and many there be that find it.
5. Thou shalt join and work for a League of the Hard of Hearing, where thou shalt receive encouragement and stimulation for thyself and wilt find happiness in serving thy brother. Thus wilt thou march forward with the Federation Army that is alleviating deafness throughout the world.
6. So love thy neighbour that thou do everything in thy power to help him when he would have speech with thee. To this end :—
7. Thou shalt study lip-reading, in season and out of season.
8. Thou shalt secure and use the best earphone thou canst discover.
9. Triumphantly shalt thou rise above thine infirmity, and so conduct thy life that the world hath need of thee.

[The psychological aspect of progressive deafness is often neglected and is of immense importance.—F. W. W.-T.]

**Congenital Deafness and Deaf-mutism.—**

*Prenatal Medication as a Possible Etiological Factor of Deafness in the New-born.*—H. M. Taylor<sup>a</sup> discusses this subject. Of 10,000,000 deaf people in the United States, 3,000,000 are children. Of 5000 deaf children examined by the National Research Council, 62 per cent are classified as congenitally deaf. It is now recognized that syphilis is not an important factor, but hitherto little attention has been paid to the possibility that drugs administered to the pregnant woman may damage the ear of the foetus. It is well known that the placenta is permeable to drugs, and quinine and the salicylates have a selective action on the auditory nerve. [Taylor includes alcohol as a drug having such a selective action, but this is open to question.—F. W. W.-T.] In reviewing the literature Taylor finds the reports of 18 cases in which death of the foetus was attributed to prenatal administration of quinine to the mother. During the 1918 influenza epidemic otitis media was rare, but there was a great increase in congenital deafness, and Taylor believes that this was due to the free use of quinine and salicylates. He remarks that in the Southern States the incidence curves of malaria and congenital deafness show a relation suggesting a common factor. In the discussion which followed, Foster stated that in 151 congenitally deaf children, 10 cases could be attributed to the use of quinine. Reaves gave details of a questionnaire to 58 mothers of deaf children. During pregnancy 17 per cent had used quinine, 18 per cent tobacco, 8 per cent acetyl-salicylic acid, and 3 per cent alcohol. [We must also remember the use of lead and quinine as abortifacients as a possible factor in cases of congenital deafness.—F. W. W.-T.]

*Auditory Remains in Deaf-mutes.*—A. Malherbe, R. Vilenski, and N. Herman,<sup>10</sup> in their researches on this subject, have examined a series of deaf-mute children by the audiometer and by an electro-vibrator utilizing bone conduction. Their preliminary report states that 15 per cent of deaf-mute children have not enough hearing to be of any use in re-education; 40 per cent have not enough hearing to be of real value, but can profit to some extent, especially from the point of view of awakening interest, by bone-conduction hearing aids; and 45 per cent have enough remains of hearing for education by an aid.

*A Plea for Early Treatment of the Deaf-mute.*—P. Franklin<sup>11</sup> believes that 84 per cent of deaf-mutes should be able to appreciate speech amplified by one of the deaf-aids now in use. He places particular value on the *audio-amplifier* and the *teletactor*. The first is an instrument for increasing the loudness of sounds, here derived from a series of gramophone records, to any required degree. These records are graduated from noises to alphabet sounds, and so on to words and sentences. The teletactor transmits amplified sounds to a vibrating plate on which the subject's fingers are placed. By combined use of these instruments the child, when he sees the teacher's lip move to form the sound, can simultaneously hear the sound by the amplifier and feel it by his fingers on the teletactor plate. Franklin emphasizes the need of early treatment in all these cases. This need is urged also by G. de Parrel and H. Hoffer,<sup>12</sup> who say that the training of deaf children should begin at two years of age. The voice of a child so educated is far more satisfactory than that of a child whose education is not started until he is six or seven.

REFERENCES.—<sup>1</sup>*Acta Oto-Laryngol.* 1935, xxii, 147; <sup>2</sup>*Jour. Amer. Med. Assoc.* 1934, ciii, 847; <sup>3</sup>*Schwartz's Erbete Taubheit*, 1933, Leipzig; <sup>4</sup>*Practitioner*, 1935, xxxiv, 780; <sup>5</sup>*Jour. of Laryngol.* 1934, xlix, 629; <sup>6</sup>*Ibid.* 1935, l, 729; <sup>7</sup>*Arch. f. Ohr. u. s. w. heilkunde*, 1934, cxxviii, 6; <sup>8</sup>*Jour. Canad. Med. Assoc.* 1934, xxxi, 284; <sup>9</sup>*Arch. of Otolaryngol.* 1934, xx, 6; <sup>10</sup>*Presse méd.* 1935, xliii, 739; <sup>11</sup>*Lancet*, 1935, i, 316; <sup>12</sup>*Rev. franç. de Phoniatrice*, 1934, April.

#### **DERMATITIS VENENATA.** A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

**Podophyllum Resin.**—W. J. O'Donovan<sup>1</sup> describes two cases of dermatitis of the hands and forearms occurring in men employed in grinding podophyllum resin, and he also quotes three cases from the literature which appear to have been due to the same cause. He points out that the face and eyes were affected in one case though in both cases masks were worn. The resin was ground in an open mill and the hands and forearms were not protected. The symptoms of the disease are similar to those of other chemical irritants. The author stresses the importance of prophylactic measures and recommends the completely enclosed grinding machine, of which he gives an illustration.

**Ragweed Dermatitis.**—L. A. Brunsting and C. N. Anderson<sup>2</sup> report 18 cases of dermatitis from ragweed. The pollen from this plant is a well-known cause of hay fever and asthma, but it is only in recent years that a dermatitis due to it has been recognized. The symptoms are fairly definite. It has a marked seasonal incidence, beginning in July or August, reaching its maximum in September, and fading away when the colder weather appears. At first it attacks the exposed parts only. The earliest signs are redness and oedema of the eyelids and neck, accompanied by considerable itching, later spreading to the rest of the face, hands, and forearms. In later attacks other areas become involved and more chronic types of dermatitis develop, associated with lichenification. It is suggested by the authors that sensitiveness is only acquired after long contact, as no patient under 28 years of age was noted. The patients give well-marked 'patch tests' to ragweed and also to the oil or oleo-resin extracted from it.

**Lily Dermatitis.**—W. H. Palmer<sup>3</sup> states that dermatitis from daffodils and narcissi is very prevalent among workers in bulb-growing districts such as Cornwall, the Scillies, or the Eastern Counties, and is often sufficient to cause serious dislocation of the industry. The rash appears soon after the cutting and branching has begun, and the typical eruption appears as an irritating papular rash on the forearms and hands. The irritation is so severe as to lead to continual scratching so that a secondary oozing eczema develops. The eczema may become generalized over the body and require weeks in bed to effect a cure. The author has tested sufferers with intradermal injections

of extracts of daffodil pollen, of narcissus pollen, and of daffodil leaves. He finds that the patients gave positive skin reactions of an urticarial type to daffodil pollen and sometimes also to narcissus pollen, and an erythematous papule occurring after a delay of twenty-four to thirty-six hours to extract of daffodil leaves. Some preliminary experiments in desensitizing by extract of daffodil leaves and stalks are described, which suggest that this method may be of considerable practical value.

REFERENCES.—<sup>1</sup>*Brit. Jour. Dermatol. and Syph.* 1935, xlvii, Jan., 13; <sup>2</sup>*Jour. Amer. Med. Assoc.* 1934, ciii, Oct. 27, 1285; <sup>3</sup>*Lancet*, 1934, ii, Oct. 6, 755.

**DIABETES.** (See also GANGRENE, DIABETIC; PREGNANCY AND DIABETES; HYPERINSULINISM AND HYPOGLYCAEMIA; PITUITARY BODY; SYMPATHETIC SYSTEM, SURGERY OF—DENERVATION OF THE ADRENAL GLANDS.)

*Sir Walter Langdon-Brown, M.D., F.R.C.P.*

It cannot be said that the last year has seen any startling advances in our knowledge of diabetes. There is in the main general agreement now as to the principles of dietetic and insulin treatment, so that this year's harvest mainly relates to matters of detail, except for claims of the benefit derived from treatment by duodenal extract, which have not been confirmed. For the rest, the geneticists have been busy on the subject of the inheritance of diabetes, and the clinicians have been quarrelling with the biochemists as to the reliability of blood-sugar curves.

**Inheritance.**—G. Pincus and P. White<sup>1</sup> consider that, in the main, Mendelian expectations as to the chances of death from diabetes are confirmed, and that it is therefore highly probable that the development of diabetes mellitus depends primarily upon the transmission of a single recessive gene. But the ordinary age-incidence relations indicate the operation of one or more secondary factors which are not yet elucidated. In conjunction with E. P. Joslin<sup>2</sup> they suggest that these secondary factors can best be studied among those whom they regard as predestined diabetics—namely, either homologous twins of diabetic parents or the offspring of two diabetic patients. K. Maddox and M. Scott<sup>3</sup> find that transmission is more frequent in the female line. They agree as to the importance of the heredity factor, but think that on the whole inherited diabetes is of a slightly milder character than the sporadic form. The first two writers<sup>4</sup> find a definitely raised blood-sugar level in the relatives of diabetic patients. On the other hand, H. S. Mackler and A. E. Fischer<sup>5</sup> failed to find any departure from normal in thirty siblings of juvenile diabetic patients even when re-examined six years later. R. M. Wilder and D. L. Wilbur<sup>6</sup> question the right to marry if both individuals come from diabetic families even though neither actually has diabetes. They consider that marriage between a diabetic and a non-diabetic is only permissible if it can be shown that diabetes has been absent from three generations of the blood relations of the latter.

**Etiology.**—Joslin and others<sup>7</sup> again stress the importance of *overweight* in the etiology of diabetes. Thus it is found to be most prevalent among persons whose work requires the expenditure of relatively little physical energy and who have higher than average incomes. As for women, the very great increase in diabetes among them reflects the betterment in their social position and the influence of labour-saving devices. These basic conditions, in the opinion of the authors, explain the real increase in diabetes throughout the world.

Boldereff<sup>8</sup> makes the startling statement that complete drainage of pancreatic juice from the body leads to diabetes, which subsides when the juice is again allowed to enter the intestine. He therefore claims that diabetes is a disease of the digestive organs (mainly the pancreas) and that the action of insulin

is indirect through stimulating the secretion of the various digestive juices. This is so revolutionary that it would be well to suspend judgement until his observations have been independently confirmed.

**The Blood-sugar Curve.**—There has long been an impression that pyogenic infections raise the blood-sugar level even in non-diabetics, and the usual practice of increasing the insulin dosage during an intercurrent infection has been based partly on experience and partly on this impression. But exact data have been lacking. E. G. Schmidt and others<sup>9</sup> have now investigated 73 cases of infection in non-diabetics by the dextrose-tolerance test. Of the pyogenic cases, 72 per cent gave distinctly raised curves, the highest being obtained in cellulitis, where the blood-sugar rose on several occasions above 300 mgrm., usually remaining raised for over three hours. Yet glycosuria occurred in only 4 cases. After the infection had cleared up the blood-sugar curve was almost invariably normal, and any tendency to glycosuria had disappeared. Of 28 patients with arthritis and rheumatoid conditions, 53 per cent gave diabetic-like curves, though the fasting level was well within normal limits.

J. S. Sweeney and others<sup>10</sup> investigated the result of injections of toxins such as that of diphtheria on insulin utilization, and found that action both of the endogenous insulin of normal animals and of injected exogenous insulin was interfered with. It would appear, therefore, that both infections and intoxications interfere with the action of insulin in the non-diabetic and the diabetic subject. Naturally this is more marked in diabetics, whose supply of endogenous insulin is lacking to a greater or less degree, which confirms the necessity for increased insulin dosage under such conditions.

Such facts as these, and the recognition of the influence of diet on the curve obtained, have, as might be expected, raised doubts as to the reliability of methods in use, which have been voiced by H. Batty Shaw at the recent International Congress on Life Assurance and elsewhere. At the Congress, Chester Brown spoke strongly in favour of the Exton and Rose<sup>11</sup> method of determining sugar tolerance, which seems well worthy of consideration. Exton and Rose perform the one-hour two-dose dextrose tolerance test by dissolving 100 gm. of dextrose in about 650 c.c. of water. This solution is flavoured with lemon and divided into two equal doses. Three containers with preservative against glycolysis are kept at hand for the blood specimens, and three containers for the urine specimens. When collecting the specimens the subjects should empty the bladder as completely as possible. The following steps are taken after a fast, preferably overnight: (1) The samples of blood and urine are collected and the first dose of dextrose is given, from one to two minutes being allowed for its ingestion. (2) Thirty minutes after the ingestion of the dextrose the blood sample is collected and the second dose of dextrose is given, from one to two minutes being allowed for ingestion. Thirty minutes later samples of blood and urine are collected. The third urine container is given the subject for a sample of the urine next voided whenever a later sample is desired. When the results of the foregoing procedure are plotted, the interpretation of the first part of the curve—that is, the part that includes the original and the thirty-minute samples—is exactly the same as the interpretation of the same part of the curve of the older procedure, and the same deductions are drawn accordingly from the blood and urine sugar values. The results of the second part of the one-hour two-dose tests indicates that normal subjects respond to the second dose of dextrose with a greater fall in blood-sugar than that occurring during the same period after only a single dose and there is no sugar in the urine. The criterion for determining diabetes in the one-hour two-dose test is a more or less steep rise of not less than 10 mgrm. of blood-sugar in the

sixty-minute sample following the second dose of dextrose, the extent of the rise being directly related to the severity of the disease. The criteria of the test for renal glycosuria are: blood-sugars that follow the normal course, or in any event never reach the diabetic level, and sugar in both specimens of urine. The criteria of alimentary glycosuria are: a sugar-free urine after fasting, but sugar in the final specimen of urine and a blood-sugar that follows the normal curve even when the level is higher than normal. Up to the present time the authors have not encountered a single instance in which the new test disagreed with the older when the results of the older test were satisfactory. On the other hand, many cases which gave doubtful or misleading responses to the older test yielded consistent and specific results to the new test.

P. H. Sprague and D. Newson,<sup>12</sup> studying the ordinary twenty-four-hour blood-sugar curve in diabetic patients, found that the level fell in the late evening and early morning to reach the lowest level for the twenty-four hours, after which it began to increase some time (in some cases several hours) before the morning meal. It is important to know, however, whether this rise occurred before the patient was awake, since Vatcher found the rise followed immediately after waking. In any case their curves indicate the need for caution in giving an evening dose of insulin.

**Blood-glucose Clearance.**—Van Slyke's introduction of a method of urea clearance in nephritis has largely replaced simple estimations of blood-urea, since it gives a more dynamic view of kidney function. It is not surprising, therefore, that R. M. McKean and others<sup>13</sup> have elaborated a method for studying the rate of clearance of glucose from the blood. The results are interesting, but the method is not as yet readily applicable to clinical work.

#### **Complications.**—

1. *Ocular.*—A. Rudy and B. Sachs<sup>14</sup> call attention to the transitory disturbances of vision in diabetes. These are very common, but insufficiently stressed in the literature; they naturally alarm the patient very much and he should be warned that they may occur but are not at all serious. They do not imply the early stage of a cataract. There is frequently myopia before treatment begins, and hypermetropia following either dietetic or insulin treatment. These observers do not find the changes directly related to blood-sugar variations, though that is a common impression; they attribute them to disturbances in the water and salt balance, as they are said to occur in non-diabetic conditions in which that balance is upset, such as alkalosis or diarrhoea.

S. R. McKee<sup>15</sup> reports that exactly 10 per cent of 1272 cases of diabetes at the Montreal General Hospital showed retinal lesions. None of them were found in diabetes free from arteriosclerosis. He believes that hypercholesterolaemia is an important factor in the production of diabetic arteriosclerosis and therefore of the retinal lesions also.

Wagener and others,<sup>16</sup> studying the retinal changes in 1052 cases of diabetes, found hæmorrhages in 17.7 per cent, which were associated with exudates in 12.2 per cent. As might be expected, these were commoner in patients over 40 years of age, and were usually but not always associated with hypertension or other vascular changes. They found that disease of the peripheral nerves was common when retinitis was present.

2. *Urinary Retention.*—W. R. Jordan and H. H. Crabtree<sup>17</sup> report 7 cases of diabetes with urinary retention, probably due to a neuropathy since the condition was often associated with diabetic neuritis. The prognosis is not good.

3. *Diabetic Gangrene.*—E. P. Joslin,<sup>18</sup> writing on the menace of diabetic gangrene, states that if in its onset it were as noisily ushered in as an attack of renal or biliary colic the results of treatment would be far different. Death

from gangrene to-day is usually the result of procrastination on the part of the physician and patient, and in the past was often associated with the inauguration of a fat-protein diet and ether anaesthesia. Surgery often receives, but seldom deserves, the blame for a fatal issue.

4. *Diabetic Coma*.—In the past a good deal of attention was directed to signs of renal failure as prognostic of coma. More than thirty years ago van Noorden called attention to the grave significance of a shower of casts in a urine previously free from them. Recently R. A. McCance and R. D. Lawrence<sup>19</sup> have re-investigated the subject of modern methods and have come to the following conclusions. Diabetic coma may be accompanied or followed by a disorganization of renal function which is characterized by: (a) Oliguria, which may be transient; (b) Retention of urea, creatinine, and probably uric acid, which may outlast the oliguria; (c) Retention of sugar and ketones; (d) Highly acid urine with normal ammonia excretion. There is no constant anatomical lesion, and under modern treatment for the coma there is a tendency for the kidney to recover without sequelae. Marcel Labbé and R. Boulin<sup>20</sup> come to somewhat similar conclusions.

5. *Diabetes and Hyperthyroidism*.—E. P. Joslin and F. H. Lahey<sup>21</sup> consider that as glycosuria is so closely related to hyperthyroidism care must be taken not to make the diagnosis of true diabetes in hyperthyroidism when it actually does not exist. They call attention to the need of avoiding unnecessary puncture of veins for tests in patients suffering from the combined diseases and advise the employment of blood from the ear. Naturally the effect of hyperthyroidism in diabetes is to increase the need for insulin, while after operation there is an increase in carbohydrate tolerance of 30 grm. or more and a marked diminution in the need for insulin.

DIAGNOSIS.—O. Leyton<sup>22</sup> calls attention to the following points which may cause difficulties in the diagnosis of diabetes: (1) The renal threshold for dextrose not only differs in different individuals, but varies from time to time in the same individual. (2) Some individuals possess the average normal power for carbohydrate eaten as starch and much less for it in the form of glucose. (3) Some individuals' metabolism cannot store carbohydrate at the normal rate, but their metabolism remains unchanged even when a full load is placed upon them by an unrestricted diet over several years. (4) The deterioration of metabolism in diabetes does not progress regularly, and temporary remissions may occur. It should be added, however, that M. Wishnofsky and A. P. Kane<sup>23</sup> were unable to find any significant difference in the glycaemia of glycosuria after dextrose and after an equivalent amount of starch, thus disagreeing with Leyton's second point.

PROGNOSIS.—Priscilla White said, "The living diabetic child is the most outstanding medical accomplishment of the past decade", and it is generally agreed that the greatest triumphs of insulin therapy are in the young patients.

Alex Glen<sup>24</sup> records an interesting case of a girl of 10 who required 60 units of insulin and constant supervision to avoid ketosis, but who after reaching puberty enjoyed good health and was capable of taking a normal diet apart from restricted intake of sugar, and only needed 20 units of insulin daily.

*Causes of Death*.—J. M. Flynn,<sup>25</sup> from a study of the fatal cases at the Peter Bent Brigham Hospital, agrees with other writers that since the introduction of insulin coma and sepsis have decreased in frequency, cardiovascular disease has shown an increase, while unusual complications have remained practically unchanged. The mortality rate of new cases has only fallen from 9 per cent prior to the introduction of insulin to 7 per cent after. This seems an astonishingly small improvement, but, taken in conjunction with the increase

of cardiovascular disease, suggests that it may be largely explained by patients living long enough to die of degenerative diseases in which insulin seems powerless.

A. Marble,<sup>26</sup> in a study of the coincidence of cancer and diabetes, rather supports the view of the increased longevity of diabetics during the last decade, and states that this has placed relatively more of them in the cancer age. It does not appear that the increase in this coincidence means that the diabetic individual is more likely to develop cancer than the non-diabetic.

#### TREATMENT.

**The High Carbohydrate Diet.**—J. N. Cruikshank<sup>27</sup> supports the general feeling in favour of reasonably high carbohydrate diet in the modern treatment of diabetes, as long as the fat is kept low.

H. R. Geyelin,<sup>28</sup> after using high carbohydrate diets for ten years, is emphatic as to their value, particularly in avoiding hypercholesterinaemia, hyperinsulinism, and complications such as tuberculosis, gangrene, and cardiovascular disease. The last-named complication, however, is regarded by most authorities as being uninfluenced by modern treatment. But most of them would agree with these authors that patients thus treated show no diminution of food tolerance or any other demonstrable retrogression of the diabetes.

E. M. Watson and M. A. Wharton,<sup>29</sup> comparing the effects of various diets, sum up mainly in favour of a high carbohydrate and a moderately restricted fat diet. If fat is less than 100 grm., patients do not appreciate it; if more than 125 grm. are given, carbohydrate tolerance falls. The authors are not convinced that blood-cholesterol varies appreciably with the fat content of the diet.

G. Porges and G. Adlersberg,<sup>30</sup> who were early in the field in the commendation of a high carbohydrate and a low fat diet, re-affirm their faith in this method in reply to the objections which have been raised by Chabanier and Lobo-Onell.

**Insulin Therapy.**—Two difficulties with insulin therapy are worth consideration:—

1. *Insulin Allergy.*—Ever since the introduction of insulin it has been noted that some patients develop local or general allergic reactions which are characteristic of protein sensitization. Sometimes a change in the particular brand employed has prevented recurrence, and in some patients the allergic reaction disappears in course of time. In some, however, it persists whatever brand is used. W. S. Collens and others<sup>31</sup> found this present in 7.3 per cent of 408 insulin-treated diabetics. They regard it as an antigen-antibody reaction (*see also* PITUITARY BODY—ANTIHORMONES) and have had favourable results by means of insulin desensitization. But their best and quickest results were obtained by injections three times a week of *histamine phosphate*, starting with 0.1 mgrm. and gradually increasing to 1 mgrm. till about 12 mgrm. have been given.

2. *Insulin Resistance.*—H. P. Himsworth,<sup>32</sup> commenting on a usual explanation of the benefit of a high carbohydrate diet, that this is at least in part due to its stimulating effect on insulin production, and that the patient is thereby rendered more sensitive to exogenous insulin, goes on to discuss the nature of insulin resistance. He believes that there is a type of diabetes not due to diminished secretion of insulin by the pancreas but to a greater or less impairment of the organism's susceptibility to insulin whether endogenous or exogenous. Marcel Labbé and others<sup>33</sup> are inclined to attribute this resistance to insulin, especially in diabetic coma, to degenerative lesions in the liver.

**Treatment by Lævo-rotatory Sugars.**—The search for qualitative modifications in the form of the carbohydrate administered to diabetics was formerly

very diligently pursued in the hope of finding some form which could be better assimilated by them. Lævulose and Jerusalem artichokes were frequently prescribed in pre-insulin days. Naturally the introduction of insulin made much of such research obsolete. It is interesting, however, to find from L. K. Campbell's<sup>31</sup> carefully controlled observations that there is no striking difference in the utilization of Jerusalem artichokes by the diabetic from that of an equivalent amount of oatmeal.

**Duodenal Extract.**—G. G. Duncan and others<sup>35</sup> record interesting observations on the value of duodenal extract in diabetes. They claim that it is most effective after a course of insulin, and that a normal blood-sugar curve has been obtained even five months after cessation of the treatment, which takes the form of 0.25 gm. of the extract by the mouth three or four times a day. The cases which failed to respond were those which had an extremely narrow margin of safety between hypoglycæmia and hyperglycæmia. But no hypoglycæmic reactions or other untoward effects were noted. Their results suggest that there is a type of diabetes due to lack of activation of the pancreatic cell-islets by a duodenal factor, and that this is the type which responds to such treatment. This brings Bayliss and Starling's work on secretin, which has suffered neglect of late, back into notice again. Duncan and his co-workers surmise that the persistence of the benefit after withdrawal of the extract suggests the possibility that the duodenal factor is to the pancreas as iodine is to the thyroid gland. But one might also compare it with the persistence of a normal blood picture in cases of Addisonian anemia after treatment has been discontinued. Their observations, if extended and confirmed, may well lead to an important advance in the treatment of diabetes. Anything which relieves the diabetic from the life-long infliction of a hypodermic syringe would indeed be welcomed. But presumably the treatment is only applicable to a rather limited type.

**Diabetic Clinics.**—L. Wislicki<sup>36</sup> describes the organization of a diabetic out-patient clinic, and shows how by suitable and regular supervision metabolic relapses were avoided, thereby effecting a considerable saving of time and money in the in-patient work. R. M. Murray Lyon,<sup>37</sup> recording the experience of such a clinic in Edinburgh, found that out of 600 diabetic out-patients, 55 per cent required insulin, but that 17 per cent of these cases were able to discontinue it, while 44 per cent of the obese cases were finally stabilized on anti-obesity diets alone.

A. M. Butler<sup>38</sup> also bears emphatic testimony to the value of properly organized out-patient diabetic clinics.

REFERENCES.—<sup>1</sup>*Amer. Jour. Med. Sci.* 1934, clxxxviii, Aug., 159; <sup>2</sup>*Jour. Amer. Med. Assoc.* 1934, ciii, July 14, 105; <sup>3</sup>*Med. Jour. of Australia*, 1935, xxii, Jan., 5, 7; <sup>4</sup>*Amer. Jour. Med. Sci.* 1934, clxxxviii, Dec., 782; <sup>5</sup>*Jour. Amer. Med. Assoc.* 1934, ciii, July 28, 240; <sup>6</sup>*Arch. of Internal Med.* 1935, lv, Feb., 314; <sup>7</sup>*Amer. Jour. Med. Sci.* 1935, clxxxix, Feb., 163; <sup>8</sup>*Jour. Amer. Med. Assoc.* 1934, ciii, Nov. 10, 1481; <sup>9</sup>*Arch. of Internal Med.* 1934, liv, Sept., 466; <sup>10</sup>*Ibid.* 381; <sup>11</sup>*Amer. Jour. Clin. Pathol.* 1934, Sept. 4, 381; <sup>12</sup>*Canad. Med. Assoc. Jour.* 1935, xxxi, Dec., 609; <sup>13</sup>*Amer. Jour. Med. Sci.* 1935, clxxxix, May, 702; <sup>14</sup>*New Eng. Jour. Med.* 1935, ccxii, June 20, 1157; <sup>15</sup>*Canad. Med. Assoc. Jour.* 1935, xxxii, May, 549; <sup>16</sup>*New Eng. Jour. Med.* 1934, ccxi, Dec. 20, 1131; <sup>17</sup>*Arch. of Internal Med.* 1935, lv, Jan., 17; <sup>18</sup>*New Eng. Jour. Med.* 1934, ccxi, July 5, 16; <sup>19</sup>*Quart. Jour. Med.* 1935, Jan., 53; <sup>20</sup>*Presse méd.* 1934, xlii, Sept. 15, 1441; <sup>21</sup>*Ann. of Surg.* 1934, Oct., 629; <sup>22</sup>*Practitioner*, 1934, cxxxiii, Nov., 699; <sup>23</sup>*Amer. Jour. Med. Sci.* 1935, clxxxix, April, 545; <sup>24</sup>*Glasgow Med. Jour.* 1934, ccxii, Nov., 194; <sup>25</sup>*Amer. Jour. Med. Sci.* 1935, clxxxix, Feb., 157; <sup>26</sup>*New Eng. Jour. Med.* 1934, ccxi, Aug., 339; <sup>27</sup>*Glasgow Med. Jour.* 1935, ccxiii, May, 293; <sup>28</sup>*Jour. Amer. Med. Assoc.* 1935, cv, April 6, 1263; <sup>29</sup>*Quart. Jour. Med.* 1935, July, 277; <sup>30</sup>*Presse méd.* 1934, xlii, Nov. 7, 1730; <sup>31</sup>*Amer. Jour. Med. Sci.* 1934, clxxxviii, Oct., 528; <sup>32</sup>*Brit. Med. Jour.* 1934, ii, July 14, 57; <sup>33</sup>*Presse méd.* 1935, xliii, July 10, 1105; <sup>34</sup>*Arch. of Internal Med.* 1934, liv, July, 82; <sup>35</sup>*Amer. Jour. Med. Sci.* 1935, clxxxix, March, 403; <sup>36</sup>*Lancet*, 1934, ii, Oct. 20, 717; <sup>37</sup>*Edin. Med. Jour.* 1935, May, 241; <sup>38</sup>*New Eng. Jour. Med.* 1935, ccxii, April 25, 760.



**DIABETES IN CHILDREN.***Reginald Miller, M.D., F.R.C.P.*

R. D. Lawrence,<sup>1</sup> in discussing the prognosis in diabetes in children, emphasizes how the outlook has changed since the advent of treatment by insulin. He quotes a striking passage written by Priscilla White and based on a study of the large number of children in E. P. Joslin's clinic in Boston. Before the insulin era, she says, it was possible to find records of only 13 cases in the entire world that had diabetes in childhood and had survived ten years; but in 1931 she had 72 such survivors on her records, 15 of whom were at college, 26 employed, and 4 married. She also is quoted as writing: "Before the discovery of insulin the mortality of diabetes in childhood was nearly 100 per cent, and to-day diabetes as a cause of death in the young has disappeared nearly to vanishing point." Lawrence's own figures, based on 128 cases of diabetes in children under the age of 16 years, confirm this, but he points out that the outlook in hospital cases is not quite so uniformly good as in those treated in private. The difference is due to the better social conditions, intelligence, and discipline in the cases treated in private practice.

How do children take to the regimen of the diabetic, the special diet, and the need for hypodermic injections? Lawrence says that by the age of 10, and sometimes earlier, the child regards the whole discipline as normal, and that whatever strain may be involved in the life seems to fall on the parents rather than on the child. With ideal opportunities for correct treatment there should be no physical or mental abnormalities as the result of the disease. Such complications as delayed puberty and retarded growth, or cataract or arteriosclerosis, Lawrence attributes to faults in the details of treatment. Careful instructions must be given as to variations in treatment during illness and infections, when the failure to modify treatment may allow severe ketosis and even coma to develop in a few days. It is common to find small doses of insulin sufficient at the beginning of treatment, and larger, even very large doses, necessary later, especially above 11 or 12 years of age. The years approaching puberty often seem to demand a greatly increased dosage, especially in girls.

Lawrence emphasizes the need for some social organization to look after certain cases. From good homes children can attend day-schools in their neighbourhood and their education is entirely normal. It is encouraging to see how willingly their teachers co-operate in any slight supervision necessary in school hours. For children whose parents wish to have them educated in certain traditions in preparatory and public schools, no adequate arrangements have been made, although by individual arrangement an occasional case is managed successfully enough at various schools. Co-operation between parents could easily arrange for this problem, and steps are being taken to start such a co-ordinated effort.

REFERENCE.—*Prognosis* (*Lancet* publication), i, 201.

**DIETETICS.** (See also VITAMINS.)*Ivor J. Davies, M.D., F.R.C.P.*

**Dietetic Deficiencies and Susceptibility to Infection.**—Helen M. M. Mackay<sup>1</sup> (London) has studied the effect of dietetic deficiencies on susceptibility to infection with special reference to children. She showed that in spite of the difficulties of the subject we have information to prove that British diets are often deficient in a variety of factors and that a deficiency of any one of a number of different constituents of the diet will increase susceptibility to infection, and that the types of infection particularly associated with individual deficiencies may vary. Thus a deficiency of iron causes a baby to be more susceptible to all common types of infection, including respiratory and gastrointestinal infections; a deficiency of vitamin D is probably particularly

associated with infections of the respiratory tract; a deficiency of vitamin A leads to epithelial changes which facilitate the entry of micro-organisms, so that skin infections are an early feature. She concludes that it is scarcely necessary to emphasize the fact that it is quite impossible for the wife of a man on unemployment benefit or getting relief from the public assistance committee to feed her family adequately, unless she has some other source of assistance. The provision of milk for school children in necessitous areas has largely met this defect; but the effect of under-feeding in adults remains almost unchanged, despite the great effort made by the State to maintain a living unemployment benefit.

**The Availability of Food.**—R. A. McCance<sup>2</sup> (London) has studied the availability of food. To be available, food must be absorbed and utilized, but 'available' has not quite the same meaning as 'digestible'. With the discovery of insulin interest in diabetic diets became greater. It was quickly appreciated that the accepted values for the carbohydrate content of fruits, vegetables, and nuts were too high, and that a revision of the figures should be undertaken. In the matter of available iron, when tested by its power to promote blood regeneration, inorganic iron was found to be much more efficacious than organic. It is thus clear that when we consider the iron content of foods we are not so interested in the total iron which they contain as in the proportion of this that is in an ionizable form, i.e., in how much of it is likely to be available to the body. Hill has worked out a method by which the ionizable iron in tissues may rapidly be determined by purely chemical means. In a table showing the total and inorganic contents of a number of foods, ox liver is superior to beef. Radish, lettuce, mushrooms, and eggs are valuable sources of available iron.

**Available Calcium and Phosphorus.**—Like iron, calcium tends to form insoluble salts, and it is due to these insoluble salts that so much of the food calcium may at times remain in the intestine and pass through the alimentary canal without being absorbed. Cereals, particularly oatmeal, have repeatedly been reported by Mellanby and others to accentuate rickets and to promote carious teeth. The supply of calcium and phosphorus in available form is best ensured by the use of such foods as milk, eggs, meat, and fish; and by seeing that children have an ample supply of vitamin D.

**Calcinosis and Scleroderma.**—W. D. W. Brooks<sup>3</sup> (London) reviews the literature of calcinosis, summarizes existing knowledge, and reports the investigations of a case of calcinosis and one of scleroderma. On a diet inadequate in calcium and phosphorus, but otherwise normal, the case of calcinosis showed a marked tendency to retain both calcium and phosphorus following a probably normal absorption. The case of calcinosis exhibited over a long period of time pathologically high levels of serum calcium, plasma inorganic phosphate, and plasma phosphatase. In this respect the values in the case of scleroderma were normal. Disodium hydrogen phosphate restored the calcium metabolism to an approximate equality of intake and output in the case of calcinosis. Accompanying this there was a fall in the level of calcium and phosphatase in the blood, and a rise in the level of phosphorus. Indications of improvement in the patient's condition also occurred. The results of various investigations suggest that in calcinosis a local tissue change, of as yet undetermined kind, results in localized fibrous tissue damage, and that when calcification occurs in these areas there may be an accompanying abnormality of calcium and phosphorus metabolism. The type of lesion present in scleroderma does not necessarily produce changes which result in abnormality in the metabolism of calcium and phosphorus.

**The Use of Insulin in Malnutrition.**—H. Blotner<sup>1</sup> (Boston) has studied

the effect of subcutaneous insulin administration in malnutrition; 79 healthy thin persons were the subjects of this study. Ten units of insulin three times a day was the standard dosage used, a few patients taking somewhat more or less than this amount. A liberal diet was employed. After insulin injections were begun, almost all the patients gained weight immediately and rapidly. The increase in weight tended to become less marked as the weight approached the normal standard. Few of the patients lost much of the gained weight even after a considerable period subsequent to the discontinuance of insulin. Insulin has a good general effect, most of the individuals receiving it feeling much stronger and more active than they had felt previously. The gain in weight resulting from the use of this drug depends on an increased intake, better digestion, and better assimilation of food. It is not due to water retention but to an actual increase in the fat deposit. The drug was first introduced for this purpose in the United States and in the practice of pediatrics. Blotner concludes that the use of insulin to produce a gain in weight in certain cases of a non-diabetic malnutrition is a reasonable, uncomplicated, and practical method of treatment. A list of references is appended.

R. L. Pitfield<sup>5</sup> (Germantown, Pa.) recommends the use of insulin in myasthenia, tuberculosis, and other disorders of nutrition. He believes that the action of insulin in the non-diabetic is not very different from its rôle in the diabetic. The use of insulin in malnutrition of various origins, other than diabetes, is now well known. Pitfield remarks on an improved *élan vital* in many mal-nourished persons while taking insulin, as if another endocrine fault had been corrected. This may be true or it may be just a part of the marked improvement in general health associated with the increase in weight. He refers to a remarkable case of myasthenia gravis of twenty-five years' duration in a medical student of the University of Montpellier, France. There was no doubt as to the diagnosis, for she saw Babinski, Lereboullette, Goldflam, and others. Biopsy of a bit of excised muscle showed that the ultimate cause of the myasthenia lay in the metabolism of the glucosides of the muscle fibres. Insulin injections (15 units, twice daily) remedied this defect with a remarkable result. Previously she was often obliged to remain recumbent, but now she was able to resume her medical course; she graduated at the age of 47 years and is now a practising physician in France.

R. H. Freyberg<sup>6</sup> (Ann Arbor, Mich.) studied the value of insulin in under-nutrition. The investigation failed to support the prevalent opinion that insulin is a valuable aid in the treatment of under-nutrition. When under-nourished patients were injected with insulin and its effect was noted separately from diet and suggestion the great majority of patients failed to show any response. The improvement which was attributable to insulin in two cases was small. The fact that improvement resulted in many patients from the suggestion accompanying injections indicates that much of the benefit commonly attributed to insulin is due to a psychic factor.

**Calcium Metabolism.**—E. C. Warner<sup>7</sup> (London) contributes a practical article on calcium metabolism which can be well recommended to practitioners. It is evident that calcium therapy has been enormously enriched by recent researches, and especially by the discovery of the active principle of the parathyroid glands, and although calcium therapy has been used in the past with very varying results, with modern methods it may be of great value in many different types of diseased conditions.

**Effect of Low-calorie Diet on Metabolic Rate.**—R. W. Keeton and Dorothy D. Bone<sup>8</sup> (Chicago) have studied the effect of diets low in calories containing varying amounts of protein on loss in weight and on the metabolic rate in obese patients. Their patients were confined to the hospital, but not to

bed, and receiving diets of from basal minus 30 per cent to basal minus 48 per cent calories, lost weight equally well when these diets contained 90 per cent or 13 grm. of protein. Such diet supplied approximately 55 per cent of their actual caloric requirement. The remainder is secured from the body fat. The metabolic rate was not lowered by a dietary under-nutrition of this degree of severity lasting for from eight to fifty-three weeks. The supplies of stored fat not only protect the body from loss of nitrogen but they also prevent the conservation of energy seen in the normal person when subjected to under-nutrition.

**Caloric Value of Middle-class Diet.**—Ethel Browning<sup>9</sup> (London) has carried out an investigation to ascertain whether the accepted standard of 3000 calories for a man and 2500 for a woman expending a moderate amount of energy is higher than the actual intake in the case of the English middle-class individual. Each article of food and drink was estimated for its caloric content on an exact basis of weight and measurement. In the case of articles composed of several ingredients, these were calculated separately, and the caloric value of a weighed portion estimated accordingly. The average caloric intake of six men considered to be representative of healthy middle-class individuals was 2042 calories, equivalent to 68 per cent of their accepted standard requirement. The average caloric intake of four women was similarly 1597 calories, equivalent to 63·8 per cent of their accepted standard requirement. Possible reasons for the discrepancy between the standard optimal and the actual caloric intake are discussed. It is concluded that the average healthy middle-class man and woman neither consumes nor requires a caloric intake of 3000 and 2500 calories respectively.

**Athletic and Training Dietetics.**—Adolphe Abrahams<sup>10</sup> (London) writes on this subject. He refers to the old injunctions and prohibitions which led to a monotonous, distasteful, even nauseating, régime, which invited staleness, boils, and other minor illnesses, during the training of the past, and not altogether absent at the present day. Athletes are young and healthy and need a full and well-balanced diet. Experience will show which is the best kind and quantity of food just before extreme exertion. Sufficient fluid should be taken to make a meal enjoyable; larger quantities may be taken when the stomach is empty; on rising, between meals, and on retiring. Alcohol is quite unnecessary to the athlete, but can be taken in small amounts at lunch or dinner by those accustomed to its use. Smoking is best avoided, except again in those accustomed to its sensible use, when its mild sedative effect on the nervous system may be an advantage.

REFERENCES.—<sup>1</sup>*Lancet*, 1934, ii, Dec. 29, 1462; <sup>2</sup>*Med. Press and Circ.* 1934, clxxxix, Nov. 21, 463; <sup>3</sup>*Quart. Jour. Med.* 1934, xxvii, July, 293; <sup>4</sup>*New Eng. Jour. Med.* 1934, cxxi, July 19, 103; <sup>5</sup>*Med. Record*, 1935, cxli, April 3, 328; <sup>6</sup>*Amer. Jour. Med. Sci.* 1935, exc, July, 28; <sup>7</sup>*Med. Press and Circ.* 1935, exc, Jan. 16, 55; <sup>8</sup>*Arch. of Internal Med.* 1935, lv, Feb., 262; <sup>9</sup>*Med. Press and Circ.* 1935, exc, Jan. 30, 101; <sup>10</sup>*Practitioner*, 1934, cxxxiii, Dec., 695.

## DIPHTHERIA. (See also SCARLET FEVER; SERUM SICKNESS.)

J. D. Rolleston, M.D., F.R.C.P.

**EPIDEMIOLOGY.**—According to J. C. Saunders,<sup>1</sup> the average decennial mortality from diphtheria in the Irish Free State has increased from 4·7 per 100,000 in 1864–70 to 9·4 per 100,000 in 1921–30, whereas during the same period it has decreased from 78·8 to 3·0 per 100,000 in Denmark, and from 11·4 to 2·29 per 10,000 at ages under 15 in England and Wales. There has been a steady increase in the diphtheria mortality in Dublin, Cork, and Limerick, as compared with a corresponding decrease in Belfast, Birmingham, and Ipswich. Saunders attributes the relatively high mortality in the Irish Free State to insufficient dosage of antitoxin, delay in its administration,

and inadequate arrangements for its distribution to practitioners, and states that a rigorous scheme for active immunization would reduce the mortality as it has done in New York.

The twelfth annual report of the *Journal of the American Medical Association*<sup>2</sup> on the diphtheria mortality in the 93 cities of the United States with a population of 100,000 or over shows that the diphtheria mortality rate per 100,000 inhabitants ranged from 1.63 for the Middle Atlantic States to 7.00 in the East South Central. Of the 15 cities without a single death from diphtheria in 1934, 4 were in New England, 4 in the Mountain and Pacific States, 3 in both the Middle Atlantic and East North Central Groups, and 1 in the West North Central Group. (See also MEDICAL ANNUAL, 1934, p. 151.)

**SYMPTOMS AND COMPLICATIONS.**—M. P. Borovsky,<sup>3</sup> who reports a case of *diphtheria of the penis* in the second week of life, ten days after circumcision, states that only 18 cases of penile diphtheria are on record, of which 15 occurred in children and 3 in adults. In only half the cases was the diagnosis confirmed by cultures, and many recovered without antitoxin, so that the diagnosis of diphtheria might be challenged in such cases. Only 4 cases occurred in children under 1 year, and Borovsky's is the youngest on record.

In a paper on *cutaneous diphtheria and congenital syphilis* M. H. Cohen<sup>4</sup> records the case of a girl, aged 11 years, the subject of congenital syphilis, whose nose was swollen and reddened and presented a foul mucopurulent discharge. The nostrils were filled with exudate, on removal of which the septum was found to be completely absent. The cartilages, subcutaneous tissues, and overlying skin had been destroyed. The Wassermann reaction was four plus. A pure growth of diphtheria bacilli was obtained from the skin and the throat. Diphtheria antitoxin and antisiphilitic remedies alleviated the acute condition, but a marked cosmetic defect resulted, for which a plastic operation would be required.

C. Calmanas,<sup>5</sup> who records 39 cases in patients aged from 2 months to 19 years, states that *otitis and mastoiditis* were formerly held to be rare events in diphtheria, but that recent investigations have shown that the presence of the diphtheria bacillus in the pus of otitis media is more frequent than used to be supposed both in infants and older children. Primary diphtheritic otitis does exist, but it is very rare. Calmanas has been unable to find any case on record of primary diphtheritic mastoiditis. Contrary to the opinion formerly held, he maintains that diphtheritic otitis is a mild affection and pursues a slow and obstinate course. The only successful treatment consists in small and repeated doses of antitoxin every two or three days for a period of three weeks.

According to M. A. M. Grenet,<sup>6</sup> *renal involvement* is rare in mild and moderate attacks of diphtheria, and when it does occur in these cases is always slight. In malignant diphtheria on the other hand nephritis may develop at the onset—when it is rarely persistent—in the course of the disease, or exceptionally at a late stage. In any case it is exceptional for the nephritis to become chronic.

A. Hoyne and N. T. Welford<sup>7</sup> state that of 4671 diphtheria patients admitted to the Municipal Contagious Diseases Hospital, Chicago, during the period 1928–32, 496 developed *myocarditis*, with a fatality rate of 62 per cent. During the first six years of life it was 75 per cent, from 6 to 10 years 54 per cent, from 11 to 15 years 50 per cent, and over 15 years 43 per cent. The fatality rate was highest (70 per cent) in cases in which there was nasal involvement, and lowest (11 per cent) among those in which the tonsils only were affected; 79 per cent of the deaths occurred during the first fortnight, the average day of disease being the tenth. Abdominal pain and vomiting were very grave prognostic signs. The most important lesion in 126 necropsies was extensive myocardial degeneration.

In the opening paper at a discussion on the nervous complications of the acute fevers J. D. Rolleston<sup>8</sup> dealt as follows with *diphtheritic paralysis*. His own observations based on the study of 2300 cases of diphtheria showed that 20 per cent developed some form of paralysis. The much lower estimates made by others were probably due to mild forms having escaped attention. In his experience paralysis and loss of reflexes were commoner in children than in adults. The frequency and intensity of diphtheritic paralysis bore a direct relation to the character of the initial angina. Paralysis was rare after purely nasal, laryngeal, or cutaneous diphtheria and after relapses in which the angina was almost always mild. It was only when the faucial lesion had been neglected or overlooked, and the case had been ambulatory throughout or the recumbent position had not been enforced for a sufficiently long period, that severe paralysis might follow mild angina. In the pre-antitoxin era early treatment had no power to cut short the disease or prevent or modify paralysis, whereas early injection of antitoxin not only jugulated the disease but diminished the frequency and severity of subsequent paralysis. Hemiplegia, which was a rare event, differed from all other paralyses in diphtheria in being primarily due to a vascular lesion, viz., cerebral embolism from cardiac thrombosis caused by mural endocarditis. The prognosis of hemiplegia in diphtheria was good as regards survival but unfavourable as regards complete recovery of function. The reflexes were lost in a considerable proportion of all cases of diphtheria, the knee-jerks more frequently than the ankle-jerks, but in only a small percentage during the first week of the disease, and their loss might persist for many weeks after clinical recovery. The superficial reflexes, viz., the abdominal in both sexes and the cremasteric in males, were lost only in severe cases of generalized paralysis, and their loss was usually of short duration. Rolleston had found Babinski's sign present in 19.6 per cent of 855 cases of diphtheria. It was essentially a phenomenon of the acute stage. It was not associated with any special condition of the tendon jerks and was never accompanied by ankle-clonus. It was most frequent and persistent in severe attacks, and was probably due to transient perturbation of the pyramidal tract caused by the circulating toxin. As regards prognosis, complete recovery was the rule in diphtheritic paralysis apart from hemiplegia, and death the exception. As he had never seen an example of chronic diphtheritic paralysis in the course of thirty-three years' experience, and only 8 were on record, of which the last was in 1906, Rolleston was inclined to think that some other cause than diphtheria was responsible for the chronicity. The prognosis usually depended on the age of the patient, the situation of the paralysis, and the date of its onset. The older the patient, the better the prognosis. The onset of cardiac paralysis before the end of the second week was of very unfavourable omen, whereas the later development of cardiac involvement was much less serious.

In a paper on *palatal paralysis following extra-faucial diphtheria*, G. W. Ronaldson and W. H. Kelleher,<sup>9</sup> who record a case of generalized paralysis following wound diphtheria in a man aged 25, state that palatal paralysis undoubtedly occurs in extra-faucial diphtheria, although it is less common and appears later than in faucial diphtheria. Paresis of accommodation is the most frequent and usually the earliest paretic sequel of extra-faucial diphtheria.

In a paper on *familial attacks of diphtheria* L. Holl<sup>10</sup> states that among 1328 diphtheria patients admitted to the Children's Clinic of Cologne University two or more were brothers or sisters in 255 cases, while in 1073 cases only one child in the family was attacked. In only 80 of the 255 cases were the others simultaneous or within six days of each other; in the great majority several weeks or months intervened between the two attacks. Several severe attacks

in the same family were unusual; but as a rule when one child in the family had a severe attack, the disease ran a mild or moderate course in the others.

J. Langer's<sup>11</sup> experience at Graz and Prague agrees with Holl's at Cologne, as is shown by the following figures: Graz and Prague (1917), single cases in a family 85 per cent, multiple cases 15 per cent. Prague (1932-4), single cases 87.2 per cent, multiple cases 12.8 per cent.

The rarity of *return cases* in diphtheria, about which little information is available, is exemplified by Langer,<sup>11</sup> who states that Sørensen in 1910 found only 82 examples (1.16 per cent) among 7037 diphtheria patients, while Langer himself had only 97 (1.15 per cent) among 7701 patients.

The occurrence of *diphtheria in the inoculated* is illustrated by E. A. Underwood,<sup>12</sup> who states that 20 cases were notified in a Schick-negative population of 2761 persons in Leeds: 16 of the 20 were clinical cases of diphtheria, and 13 required antitoxin in doses ranging from 8000 to 100,000 units. Only 1 case was severe, and 5 were moderately severe. The only complication was albuminuria. No deaths occurred. In 19 of the 20 cases the organism was of the *gravis* type, which was probably the cause of the breakdown in immunity of the cases. Underwood concludes that although natural and artificial immunity is more likely to be broken down in a community in which *gravis* infection predominates, the resulting disease is much milder than it would otherwise have been.

**SCHICK TEST.**—J. Cauchi and E. C. Smith<sup>13</sup> found that of 1454 native children under the age of 10 in Lagos, Southern Nigeria, 15 to 20 per cent were Schick-positive, and only 2 per cent over 10. Although clinical diphtheria is almost unknown in Southern Nigeria, natural immunization by subclinical infection appears to be active.

**PROPHYLAXIS.**—A. E. Keller and W. S. Leathes<sup>14</sup> describe a method of rapid immunization against diphtheria by injection of a single dose of 1 c.c. of alum-precipitated diphtheria toxoid, which gave much better results than any other method. In one group of Schick-positive children 60 per cent became negative in 14 days, 95.6 per cent in 28 days, and 100 per cent in 42 days after injection. In another group of 53 children 92.4 per cent became negative 22 days after one injection, 94.3 per cent in 60 days, and 96.2 per cent in 90 days.

E. A. Underwood<sup>15</sup> tested a batch of alum-precipitated toxoid on 152 Schick-positive children, of whom 83.6 became Schick-negative within four weeks. The reactions, which he classifies under the three groups of general, local erythema, and local induration, were very mild as a rule, and in only two cases were very severe.

On the other hand, D. G. Lai,<sup>16</sup> who inoculated 489 children, mostly of school age, with a single injection of alum toxoid, did not have such good results. The majority of his cases showed some local reaction such as pain, swelling, induration, and abscess, and 6 per cent a general reaction consisting in fever, headache, and malaise. Within three months of the inoculations Schick tests were again performed on 359 cases, and only 13.4 (62.6 per cent) were found to be immune. Lai concludes that a single dose of alum toxoid does not give enough protection to all susceptible persons against diphtheria.

H. J. Parish and J. Wright<sup>17</sup> state that with the spread of severe diphtheria in many areas in England, isolated cases and small outbreaks have been reported in Schick-negative reactions. The infective strains have usually been *C. diphtheriae gravis*, less frequently the intermediate type. The attacks have usually been mild, although moderate and a few severe ones have been reported. The amount of antitoxin in a Schick-negative reaction may be as little as  $\frac{1}{100}$  to  $\frac{1}{500}$  unit of antitoxin per c.c. of serum. If such a person contracts the disease,

it will almost always be mild, but when a fairly high general level is maintained either by latent immunization or by repeated prophylactic injections, clinical infection with diphtheria is negligible. The writers suggest that an immunizing course of F.T., T.A.M., or T.A.T. should consist of at least three injections and not two only as is sometimes recommended.

(See also TYPHOID FEVER.)

**TREATMENT.**—M. Mitman and N. D. Begg<sup>18</sup> record 8 cases of severe diphtheria complicated by diaphragmatic paralysis which were treated by the *Drinker respiratory apparatus*, the function of which is to replace or augment the failing respiratory mechanism: 5 recovered and 3 died, but 2 of the latter had commencing bronchopneumonia before entering the respirator. Among the recoveries the shortest period of retention in the respirator was 4 days and the longest 15 days.

In the treatment of myocarditis A. Hoynes and N. T. Welford<sup>7</sup> found that adrenalin and caffeine were of no value as permanent circulatory stimulants, whereas parenteral injections of *glucose solution* seemed to be life-saving in severe cases.

**REFERENCES.**—<sup>1</sup>*Irish Jour. Med. Sci.* 1934, 6 s. 520; <sup>2</sup>*Jour. Amer. Med. Assoc.* 1935, civ, 2182; <sup>3</sup>*Ibid.* 1399; <sup>4</sup>*Arch. Dermatol. and Syph.* 1934, xxx, 207; <sup>5</sup>*Thèse de Paris*, 1934, No. 325; <sup>6</sup>*Ibid.* No. 488; <sup>7</sup>*Jour. of Pediat.* 1934, v, 642; <sup>8</sup>*Proc. Roy. Soc. Med.* 1933-4, xxvii, 1421; <sup>9</sup>*Brit. Med. Jour.* 1935, i, 1019; <sup>10</sup>*Monats. f. Kinderheilk.* 1934, ix, 264; <sup>11</sup>*Med. Klin.* 1935, xxxi, 382; <sup>12</sup>*Lancet*, 1935, i, 364; <sup>13</sup>*Ibid.* 1934, ii, 1393; <sup>14</sup>*Jour. Amer. Med. Assoc.* 1934, ciii, 478; <sup>15</sup>*Lancet*, 1935, i, 364; <sup>16</sup>*Chinese Med. Jour.* 1935, xlix, 340; <sup>17</sup>*Lancet*, 1935, i, 600; <sup>18</sup>*Ibid.* 1438.

## **DISSEMINATED SCLEROSIS.** Macdonald Critchley, M.D., F.R.C.P.

**Treatment with Quinine.**—Although arsenic remains to-day the most widely favoured drug in the treatment of disseminated sclerosis, not even the most sanguine observer can view the results obtained with anything approaching complacency. Any contribution to the treatment of this chronic and disabling affection is therefore welcome. For some years past the American neurologist R. M. Brickner<sup>1-3</sup> has been treating cases of this disorder with preparations of quinine. This drug was suggested by Marburg's belief that disseminated sclerosis might be the effect of a circulating lipolytic agent, destroying in places the myelin sheaths within the central nervous system. The inhibitory effect of quinine upon some of the lipases of the blood suggested that the drug might be of service in cases of disseminated sclerosis.

The principle is to administer by mouth as much quinine hydrochloride as possible without the production of cinchonism. This complication would probably prove harmful to the patient's neurological condition. Quinine medication needs to be maintained, theoretically, over an indefinite period, although Brickner permits those patients who are relatively free from symptoms to omit the drug over periods of weeks or months.

In a five-year survey of cases treated with quinine, Brickner has collected 49 patients. These have been observed over periods varying from 6 months up to, in one case, 5 years. Brickner concludes that quinine therapy has been helpful: 8 patients have shown significant symptomatic regression. Of these however, 2 have since died. Seven patients showed isolated regression of a single symptom, of whom 1 has since died. In 25 patients the condition is in a state of remission or there is definite improvement, and in 10 patients the condition is arrested. In 10 patients, it must be stated, fresh symptoms actually developed during the course of the quinine treatment.

Certain comments upon these results seem to be called for. In the first place, the series of 49 cases is too small, particularly when one is dealing with such a common neurological affection as disseminated sclerosis. Secondly,



as the author himself admits, there is no control series whatever. It is, perhaps, noteworthy, that the best results were traced in patients with short histories, who were afflicted with their first attack of neurological symptoms and whose symptoms were not far advanced. Such cases are precisely those in which spontaneous and striking remissions are to be expected.

Quinine therapy has been tested in this country by many neurologists over the course of the last five years. In the reviewer's experience no measure of improvement has resulted to suggest that it can equal arsenic in general efficacy.

REFERENCES.—<sup>1</sup>*N. Y. State Jour. Med.* 1931, xxxi, 885; <sup>2</sup>*Arch. of Neurol. and Psychiat.* 1932, xxviii, 125; <sup>3</sup>*Ibid.* 1935, xxxiii, 1235.

**DRUG ADDICTION.** (*See* ALCOHOL AND DRUG ADDICTION.)

**DUODENAL ULCER.** (*See* GASTRIC AND DUODENAL ULCER.)

**DYSENTERY, AMOEBIC.** (*See* AMOEBIASIS.)

**DYSENTERY, BACILLARY.** *Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

ETIOLOGY.—A bacteriological study of dysentery among the troops at Quetta is reported on by D. T. M. Large,<sup>1</sup> who found a spring increase in the incidence due to Sonne bacillus in May and June, with a special incidence on children, and a second rise in August and September due to infections by the Shiga and Flexner bacilli, although the cause of this seasonal variation was not determined. In July there was a marked lull. The rises were preceded by an excess of irritant particles of silica washed into the water-supply by rain and by frequent dust storms. The relationship noted elsewhere between humidity and flies and dysentery also exists in Quetta, and although flies are numerous in this station, it is thought they may be responsible for the spread of the disease from missed cases. The bacteriological variations noted may be of importance in relation to the type of prophylactic vaccine indicated at different seasons.

TREATMENT.—In a long paper on *bacteriophage* treatment of bacillary dysentery F. H. McCay<sup>2</sup> deals once more with his former experience in Calcutta already noted in the MEDICAL ANNUAL of 1934 (p. 160), and in a review of other trials he concludes that it has not proved very successful except in the hands of its originator d'Herelle.

REFERENCES.—<sup>1</sup>*Jour. R.A.M.C.*, 1934, lxiii, Sept., 157; <sup>2</sup>*S. African Med. Jour.* 1934, viii, Oct. 18, 721.

**EAR, AFFECTIONS OF.** (*See also* DEAFNESS.)

*F. W. Watkyn-Thomas, F.R.C.S.*

#### RECENT SCIENTIFIC WORK ON THE EAR.

**Function of the Tympanic Muscles.**—The method of experiment devised by Wever and Bray (*see* MEDICAL ANNUAL, 1933, p. 148) is being widely applied, and has already justified the hopes that were expressed when it was first described. Working on these lines, C. S. Hallpike<sup>1</sup> has investigated the function of the tympanic muscles. It is generally admitted that the intra-tympanic muscles (stapedius and tensor tympani) are reflexly stimulated by sound waves, but there has been considerable disagreement as to the 'functional significance' of this reflex. Some think that it is essentially a protective mechanism which guards the cochlear nerve-endings against too violent stimulation; others regard the muscles as a mechanism for increasing the sensitivity of the inner ear, as in listening. Hallpike's results may be summarized briefly thus: (1) Reflex contractions of the tympanic muscles occur in

response to sounds of fairly *high* intensity. This suggests that the response is more likely to be called out for protection than for increasing sensitivity to sounds that are already 'penetrating'. (2) These muscular contractions actually do cause a decrease in the amplitude of the response of the cochlea caused by sounds. This may be taken as a proof that the contractions exert a damping effect on sound vibrations, and it is legitimate to assume that this damping effect is protective. (3) Some evidence suggests that the ear can manufacture overtones.

[Hallpike's work on this subject is not yet complete, but up to the present he has established his case, and, unless further work shows some fallacy, those of us who believe that the intratympanic muscles 'tune-up' the cochlea will have to abandon this attractive hypothesis.—F. W. W.-T.]

**Auditory Fatigue.**—This is a subject of the utmost practical importance in the treatment of deafness; there are many people who hear quite well in the morning, but find themselves deaf after a tiring day, and there are deaf patients who can hear fairly well with some kind of electrical aid but find that it tires their ears too much to be of real use. Our ignorance of the precise causation of auditory fatigue is a great handicap in our attempts to help these patients, but recent work by W. Hughson and E. G. Witting<sup>2</sup> gives some assistance. They point out that the mechanism of the middle ear comprises two groups: (1) The tympanic membrane and the ossicles, which conduct sound waves to the inner ear and can enhance sounds of low intensity; (2) The intratympanic muscles, which form the protective mechanism for the inner ear. Apart from this, no evidence was obtained which would indicate a specific function for any one structure. A point of great importance is that fatigue is not specific as far as response to individual frequencies are concerned—that is to say, that if the ear is submitted to one tone until it is fatigued, it is thereby fatigued for all tones. The authors found that the tones between 250 and 2000 double vibrations per second seemed to cause more profound fatigue than those above or below this range.

In these experiments the Wever-Bray technique was used. In another research, using the same method, W. Hughson, S. J. Crowe, and H. A. Howe<sup>3</sup> showed that the element of fatigue is a property of the nerve, not of the cochlea; and, further, that if there is any pathological condition of the middle ear which interferes with the transmission of sound to the end organ, fatigue cannot be shown in the response picked up in the nerve.

**Mechanical Damage to the Cochlea.**—P. H. G. van Gilse,<sup>4</sup> also using the Wever-Bray method, examined the effects of mechanical damage to the cochlea. He punctured the cochlea with a dental drill, allowed time for degeneration to take place, and then tested the Wever-Bray response. He found that if any part of the spiral ganglion survived, its filaments could transmit vibrations to some extent, although feebly and capriciously. This finding is comparable with the results sometimes found in patients who have sustained fractures of the petrous bone.

#### INJURIES TO THE EAR.

**Sound Injury to the Ear.**—W. Undritz and R. Sassosow<sup>5</sup> have studied sound injury to the ear by a new method. In previous experiments whistles and detonations have been largely used; neither give pure tones, and detonations may cause gross mechanical injury. These authors use a vibrating quartz plate, by which they can produce short-wave tones of high intensity within and above the hearing range. (The tones above the hearing range are described as 'supra-sonics'.) They found that high tones within or above the hearing range can produce hæmorrhage into the labyrinth, displacement

and changes of form in the cells of the organ of Corti, and detachment of the otolith membrane of the sacculle. [The injury to the sacculle is interesting as supporting the view of Hallpike (*see* MEDICAL ANNUAL, 1935, p. 113) that the sacculle is concerned with sound vibrations rather than with equilibrium.—F. W. W.-T.]

**Concussion of the Labyrinth.**—O. Voss<sup>6</sup> asks whether there is such a lesion as concussion of the labyrinth. Many authors, especially Ulrich and Nager, deny the possibility of such an injury, without fractures of the petrous or tearing of the auditory nerve. They believe that with improvement in X-ray diagnosis this will be proved to be true, except in cases of definite traumatic neurosis without any organic basis. Voss believes that labyrinth concussion is a real thing, and has been able to demonstrate it histologically in one case. The possible factors in causing the injury are: (1) Sudden pressure disturbances in the labyrinthine fluids, (a) via the oval window, (b) by momentary compression of the saccus endolymphaticus in the posterior fossa. (2) Circulatory disturbances from injury to the vasomotor centres. (3) Haemorrhage into the labyrinth with secondary degeneration of the nerve-elements. (4) Microscopic fissures in the labyrinth capsule.

#### SUPPURATIVE CONDITIONS OF THE MIDDLE EAR.

##### **The Association of Accessory Sinus Disease and Middle-ear Infection.**

—M. M. Cullom<sup>7</sup> deals with a series of over one hundred cases of mastoiditis operated on by him in his private practice during a period of fourteen years. From a careful follow-up of his cases he believes that 85 per cent had a 'demonstrable sinus infection', and that in nearly all cases the affected nasal sinus was on the same side as the mastoiditis. He supports his contention by quotations from other writers, E. H. Campbell (1932), D. G. Hoople (1933), and D. S. Childs (1933). Their cases were principally children, and Cullom's adults, but there is a close correspondence in the figures. In the discussion which followed, Lyman Richards admitted that the figures showed a frequent coincidence between nasal sinus disease and middle-ear infection, but he pointed out that any epidemic disease involving the upper respiratory tract would probably show a high percentage of cases of sinusitis, at any rate if we relied on the evidence of X rays. The important question was whether such involvement was of sufficient clinical significance to require specific treatment. This decision could not be based on the X-ray examination alone, and until full examination of the sinus contents had been made the diagnosis of accessory sinus suppuration in these cases was only an assumption. Non-infective allergic swelling of the sinus mucosa wall was well known to give X-ray evidence of varying degrees of opacity which it was all too easy to ascribe to infection. G. E. Shambaugh said that if otitis media followed the nasal sinus infection, the sinusitis could fairly be blamed, but in many cases the two conditions began simultaneously. Purulent sinusitis was a common cause of deafness in children, but in severely deafened adults he found very few cases of suppurative sinusitis.

[It is not clear what evidence Cullom accepts as proof of sinus infection. In most cases it seems that skiagrams showed the antrum as the suspected sinus, but we are not told whether the suspicion was confirmed by puncture. We know that in many cases of acute coryza the antrum is temporarily infected, to the extent at any rate of containing fluid, and becomes normal again in a few days as soon as the surrounding congestion allows the cilia to do their duty. In some cases, undoubtedly, mastoiditis is associated with true antral suppuration, but subject to further evidence these cases may be regarded as exceptional.—F. W. W.-T.]

**Mucosus Otitis.**—P. Ohnacker<sup>9</sup> believes that there is an increased incidence of mucosus infection. During twelve months at one clinic there were 50 operations for mastoid abscess, in which there were 17 cases of mucosus infection. During the same period there were 3 cases of nasal sinus infection by this organism. The increase cannot be explained by difference in method of investigation, as there had been no change in the laboratory technique. In the 3 nasal sinus infections 2 were very severe, and 1 patient died. [In view of the insidious and dangerous character of mucosus infection (*see* MEDICAL ANNUAL, 1935, p. 117) this real and unexplained increase of incidence is of the greatest importance.—F. W. W.-T.]

**X-ray Examination in Otitis.**—G. Dohlman<sup>9</sup> asks, "What can radiography contribute at present in acute and chronic otitis?" He believes that radiography of the temporal bone is particularly difficult, and requires highly skilled methods. During the first week of an acute otitis X-rays are of little diagnostic value. Blurring of the cell system is of no great significance either as to progress or as an operative indication. But the skiagram does give information as to the extent of the cells, e.g., into the petrous or the zygoma or behind the lateral sinus. After the third or fourth week it is of more value as an indicator for treatment. In mucosus infection it may show cell-destruction disproportionate to the other signs. In chronic suppurations the cells are usually poorly developed, but X-rays may show a large cholesteatoma, and will thus give useful information as to whether conservative treatment is worth trying. X-rays do not help much in the diagnosis of intracranial complications.

**Surgery of the Petrous Apex.**—M. C. Myerson, H. W. Rubin, and J. G. Gilbert<sup>10, 11</sup> have worked out a new method of reaching the petrous apex. Their anatomical studies of 200 petrous bones showed pneumatization of the apex in 11 per cent as compared with 38 per cent of pneumatized mastoids. In 36 children's bones up to 7½ years old, no pneumatic tip was found; the youngest specimen with a pneumatic tip was 15 years old. In only 2 specimens, both from the same skull, was there a track of peritubal cells leading to the apex. The best developed and most frequently found cell tracks to the apex were those in the angle between the facial nerve and the superior semicircular canal, and those arising behind and below the cochlea. In all but two specimens they found on the antero-superior border of the pyramid four landmarks: (1) An elevation for the superior semicircular canal; (2) A depression between this and the external lip of the internal auditory meatus; (3) The upper lip of the internal auditory meatus; (4) A depression marking the petrous apex. The first depression corresponds posteriorly with the sub-arcuate fossa and anteriorly with the origin of the great superficial petrosal nerve. The foramen spinosum and the middle meningeal artery are parallel with the inner lip of the internal auditory meatus, and the third division of the fifth nerve is two millimetres internal to this. On these anatomical data they base their operation. In general principles it resembles Eagleton's operation for 'unlocking the petrous' (*see* MEDICAL ANNUAL, 1935, p. 118), but the dura is stripped until the third division of the fifth nerve is seen and the bone of the apex is then broken into by a gouge, with a cutting edge at an angle of 135° from the shaft, placed external to the second depression well on the posterior superior border to avoid the carotid canal.

[We must remember that the majority of cases of petrositis clear up satisfactorily after an adequate mastoid operation. If anything further has to be done, this operation has the advantages of simplicity and a sound anatomical basis. In view of the rarity of any track from the peritubal cells to the apex it seems preferable to the operation of Almour and Kopetsky, which also necessitates a radical operation.—F. W. W.-T.]

## INTRACRANIAL COMPLICATIONS OF EAR DISEASE.

**Diagnosis and Treatment of Abscess of the Brain.**—In a discussion on this subject, H. Cairns and C. Donald<sup>12</sup> held that, although in many cases the chances of a successful result were poor from the start, there were other cases in which the fault lay not in the inability of the tissues to localize the infection, but in the failure of the surgeon to find and drain the abscess. Cases in which the pus yields an abundant and virulent growth of organisms, and cases in which there is a heavily infective pansinusitis, fall into the first group; the second group comprises the cases in which there has been an error in treatment or in diagnosis.

**ERRORS IN TREATMENT.**—These may be in the choice of time for operating, in the kind of operation chosen, in finding the abscess, in drainage, and in after-treatment.

1. *Time of Operation.*—A chronic abscess has a thick wall composed of (a) pyogenic membrane, (b) chronic inflammatory cells, (c) a zone of fibrous tissue, (d) an outermost zone of gliosis. An acute abscess has no such walls, and the exploring needle meets no resistance on entering. The acute abscess is an acute purulent encephalitis, and it is impossible to drain it. It is therefore probably better not to disturb an abscess until it is localized.

2. *Suitable Type of Operation.*—In chronic abscesses of long standing which cause few symptoms, or leak through a sinus, the wall is usually 0.5 cm. or more in thickness. Such abscesses are often loculated or multiple. The only adequate treatment is to excise the abscess as if it were a tumour; such an abscess cannot be satisfactorily drained and the wall is too dense to be absorbed.

3. *Finding the Abscess.*—This should be done with a graduated brain exploring needle through a hole drilled in the cranium. Sinus forceps and sharp-pointed weapons should be avoided.

4. *Drainage.*—This may be either by the 'closed' or the 'open' method: (a) The closed method: the depth of the abscess is marked on the brain needle and a size 10 Jacques catheter is pushed into the brain and left *in situ*. (b) The open method: this may be done through an opening of 3 to 4 cm. in diameter, or by an osteoplastic flap. The closed method is better for deep abscesses; the open is satisfactory for the superficial abscess.

5. *After-treatment.*—Dressings should be as few as possible and the tube should not be disturbed. Post-operative œdema is a common and little understood complication. One thing only about it is clear: it should not be treated by further surgical intervention.

**ERRORS IN DIAGNOSIS.**—These are best avoided by the rigorous examination of every patient who has a severe headache after mastoid operation; the early examination of the visual fields; lumbar puncture, with the greatest care that not more than 1 c.c. of fluid be withdrawn; if necessary, diagnostic exploration. Sydney Scott agreed that premature exploration is unwise. It is important to remember the transitory nature of many signs, especially in cerebellar abscess. In exposure of the dura it is not necessary to do a radical mastoid operation as a routine; an extended Schwartze operation is often adequate. He also urged the importance of doing as little as possible after the abscess had been found and drained. F. C. Ormerod believed that in most cases of otogenic cerebral abscess the track from the mastoid is closed before the abscess gives rise to symptoms, and advocated exposure and drainage through the wall by a wide decompression, a method which avoids the concussion of the mallet and gouge on dense bone, and gives easier and more direct drainage. Sir Charles Ballance pointed out that where brain abscess is secondary to bone disease we have a continuous disease-process; in nearly

all cases we should be able to follow the infection along its track. E. M. Atkinson believed that it is a mistake to wait for localizing signs before exploring, because such signs are largely dependent on surrounding œdema and are often transient.

[This discussion may be taken as a fair and full statement of present knowledge and opinions. There is general agreement that our surgery should be adequate and gentle; that when we have done our operation we should refrain from meddling; that signs are transient. The points of disagreement are whether it is better to operate early or late, and whether it is better to follow up the infection or attack through a fresh area. On the whole the consensus of opinion seems to be in favour of delayed operation through the area of infection.—F. W. W.-T.]

(See also BRAIN, ABSCESS OF.)

**Meningitis Secondary to Ear and Sinus Infections.**—L. S. Kubie<sup>13</sup> advocates *forced drainage* as a method of treatment. Ten years ago Weed showed that the secretion of cerebrospinal fluid was affected by changes in the osmotic tension of the blood. On this observation Kubie has based his method of treatment. The principles may be stated as follows:—

1. Normally nearly all the fluid is formed by the choroid plexus; some is formed by the cerebral capillaries, but is quickly re-absorbed and does not reach the subarachnoid space.

2. When pressure is reduced by drainage re-absorption is reduced, and the fluid from the capillaries passes by the perivascular track to the subarachnoid space.

3. The rate of formation can be enormously increased by lowering the osmotic tension of the blood and simultaneously draining the subarachnoid space; this does not increase the intracranial pressure or cause cerebral œdema.

4. In inflammatory conditions the products of inflammation are carried along with the fluid.

5. It is probable, but not proved, that forced drainage carries immune bodies into the cerebrospinal fluid through the normal barrier.

6. The best method of reducing the osmotic tension of the blood is by intravenous injections of hypotonic saline, with sufficient salt to prevent hæmolysis.

‘Forced drainage’ differs from simple drainage in that it is really an *irrigation*; thus the meninges do not collapse on the central axis, which obstructs the escape of cerebrospinal fluid, the subarachnoid space is kept full, and the perivascular drainage is increased.

The method is not suitable for cases of abscess, or for patients with pulmonary, cardiac, or renal disease. [Kubie regards bacteriæmia as a contra-indication, but considering the free passage of cerebrospinal fluid into the circulation we may regard all cases of septic meningitis as potential cases of bacteriæmia, so this objection is hardly valid.—F. W. W.-T.] The method suggested is to drain off the cerebrospinal fluid by lumbar puncture and give intravenously 2 to 3 litres of 0.45 hypotonic saline in the course of one to three hours. Drainage can be repeated daily, or even continued steadily for a whole day.

Kubie does not lay down any rule as to whether forced drainage should be done before or after dealing with the primary focus. In labyrinthitis he believes that forced drainage should be done first, and if the meningitis improves, the labyrinth operation should be done. [The method seems most promising and valuable, but this final contention is unsound. The rule of surgery that in suppurating conditions we should first attack the first focus holds good for the labyrinth. Moreover, the simple addition of a translabyrinthine drainage

supplies an admirable exit for the cerebrospinal fluid, and an exit along the route of infection, not a long way off through the lumbar theca.—F. W. W.-T.]

REFERENCES.—<sup>1</sup>*Proc. Roy. Soc. Med.* 1934, Nov. 2; <sup>2</sup>*Acta Oto-Laryngol.* 1934, xxi, 457; <sup>3</sup>*Ibid.* xx, 9; <sup>4</sup>*Ibid.* 33; <sup>5</sup>*Ibid.* xxi, 487; <sup>6</sup>*Arch. f. Ohren.* 1934, cxxxviii, 264; <sup>7</sup>*Jour. Amer. Med. Assoc.* 1934, ciii, 1695; <sup>8</sup>*Zeits. f. Laryngol.* 1934, xxv, 252; <sup>9</sup>*Acta Otolaryngol.* 1934, xx, 471; <sup>10</sup>*Arch. of Otolaryngol.* 1934, xix, 699; <sup>11</sup>*Ibid.* xx, 520; <sup>12</sup>*Jour. of Laryngol.* 1935, 1, 73; <sup>13</sup>*Ann. of Otol. Rhinol. and Laryngol.* 1934, xliii, 692.

## ECZEMA.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

J. H. Percival<sup>1</sup> has made some interesting observations on a "group of eczematous eruptions" which are known under a variety of names: 'eczematide' (Darier), 'eczema seborrhœicum' (Unna), and 'parakeratosis psoriasiformis' (Brocq). The eruption consists of symmetrically distributed dry scaly lesions, varying in size from 2 to 3 cm. in diameter, situated chiefly on the trunk and arms, and having the characteristic histology of eczema. They often have a psoriasiform appearance. Percival's observations tend to show that these lesions are of an allergic nature due to a variety of antigens. He divides 16 cases observed by him into three groups. In the first group 6 cases are reported which are apparently due to chemical irritants. In 2 cases picric acid, in 3 perchloride of mercury, and in 1 iodoform, had been used for various purposes. All the cases had positive patch tests to weak solutions of the substance concerned, but intradermic and scratch tests were negative. In one picric acid case and one perchloride of mercury case small doses administered orally produced a recurrence of the eruption. In the second group of 4 cases, septic wounds which were treated with various antiseptics preceded the eruption. In none of these cases did the antiseptics concerned produce any skin reaction, whether to patch, intradermic, or scratch tests. In the third group 6 cases of moist intertriginous dermatitis are included, the retro-auricular regions and groins being affected. Secondary urticarial lesions developed, which subsequently transformed themselves into patches as described above. In none of these cases was sensitiveness to medicaments used demonstrated.

REFERENCE.—<sup>1</sup>*Brit. Jour. Dermatol. and Syph.* 1935, xlvii, March, 109.

## ELECTROCARDIOGRAPHY. (See also CORONARY ARTERY DISEASE.)

A. G. Gibson, M.D., F.R.C.P.

R. H. Bayley,<sup>1</sup> in studying the frequency of the different forms of *bundle branch block* by means of precordial leads, finds that in the majority of electrocardiograms there is a sudden and pronounced upward excursion during some period of the QRS interval. This chief upstroke represents a sudden large negative variation in the potential of the exploring electrode and points to the arrival at the epicardial surface of the excitation process in the subjacent portions of the ventricular wall. This upstroke is early when the exploring electrode is placed over the contralateral ventricle and late when it is placed over the homolateral ventricle. Using this method as a means of determining the frequency of the different types the author finds that 64 per cent are left and 46 per cent right bundle branch block in arteriosclerotic heart disease. A similar proportion is true of hypertensive heart disease and of syphilitic heart disease, while rheumatic heart disease is more commonly right bundle branch block.

C. C. Wolferth and A. Margolies<sup>2</sup> find that by taking careful graphic records of the apex of the heart in the common type of bundle branch block in some patients a bifid systolic impulse can be recorded. It also can be recorded apart from the electrocardiographic evidence of bundle branch block. Their inference from a study of the tracings is that the ejection of blood from the left ventricle is delayed in the common type of this abnormality, with no

delay in the contraction of the right ventricle. This coincides with the modern interpretation that the commoner type of bundle branch block is the result of a left-sided lesion.

H. T. von Deesten and M. Dolganos<sup>3</sup> describe an atypical bundle branch block with a favourable prognosis, mentioning five cases. One of these patients is alive at the end of eleven and a half years at the age of 72. In four cases which have been traced there are no cardiac symptoms. The electrocardiogram cannot be identified with either of the two main types but has in Lead I a moderate R wave with a prolonged notched S wave of smaller amplitude than the R wave.

Those changes which are to be found in the electrocardiogram in the RT period commonly associated in a high percentage of cases with coronary occlusion, and known as the *coronary T wave*, are also to be found in electrocardiograms from cases of pericarditis, and in so far as pericarditis is often to be detected in coronary thrombosis the distinction is of importance. This subject is referred to by A. A. F. Peel,<sup>4</sup> and by E. H. Schwab, and G. Herrmann.<sup>5</sup> The former of these authors reports 6 cases and ascribes the changes to myocarditis rather than to pericardial effusion, though he points out that in experimental work changes occur by raising the intrapericardial pressure. His cases included mitral stenosis with acute serofibrinous pericarditis, lobar pneumonia with pneumococcus pericarditis, rheumatic endocarditis with pericarditis (2 cases), and relapsing pericarditis with effusion. Schwab and Herrmann record seven cases. The distinction appears to lie in the fact that these cases are primarily cases of pericarditis or some ailment in which pericarditis is a complication. They also tend to be seen in younger patients rather than older.

Occasionally *inversion of the T wave* in Leads I or II is seen in those who show no clear evidence of cardiac disease. This inversion has been associated with serious myocardiac affection. Graybiel and White<sup>6</sup> describe this abnormality in what they term 'neuro-circulatory asthenia'. The group was comprised of 7 patients, 3 men and 4 women, with an average age of 24½ years. There was no ascertainable organic disease of the heart. The subjective symptoms of palpitation, fatigue, dyspnoea, and an ache over the heart were similar in all patients, and induced by abnormally small effort. There was also nervousness, dizziness, faintness, and excessive sweating. The heart-rate was rapid, on the average 112. Systolic murmurs were heard in 3 only. It would appear to correspond to that described in the War as effort syndrome.

In the *QRS complex an appearance is sometimes shown of a capital M or W*. J. Edeiken and C. C. Ivreforth<sup>7</sup> state that this occurs in those cases showing other abnormalities of prognostic significance such as inverted T waves, bundle branch block, and complete heart-block. They also appear in records in which the abnormalities are slight. In 1077 electrocardiograms from normal persons it has not been observed, and in 116 patients with the anginal syndrome it was found 5 times. In some of these it was persistent, in others transient. It is suggested that it implies an intraventricular abnormality of conduction as the result of myocardial disease. In 3 cases in which a post-mortem examination was made the myocardial damage was extensive.

A. W. Wallace<sup>8</sup> finds that a *large Q wave in the third lead* is significant of abnormality. In a total of 103 cases 50 per cent were present in cases of angina pectoris, 18 per cent in hypertension, and 20 per cent in arteriosclerotic heart disease not included in these two categories. In other forms of cardiac disease it was rarely found. It is very seldom seen in normal individuals, and Pardee is quoted as having found it twice in 277 normal cases, and Edeiken and



Wolferth once in 826 records. On the other hand, it has been found commonly in the electrocardiograms of infants below one year. Conditions which elevate the diaphragm and rotate the heart to the left may at times result in such a wave. For this reason it is supposed this wave is found in pregnancy; it disappears after parturition.

S. M. Katz and S. R. Slater<sup>9</sup> found in 4 per cent of a series of 8000 electrocardiograms a *second positive S wave in Lead III*. Analysis shows that in at least 86 per cent there was clinical evidence of cardiac disease. The average age of the patients in which it was found was 41.9 years.

REFERENCES.—<sup>1</sup>*Amer. Jour. Med. Sci.* 1934, clxxxviii, 236; <sup>2</sup>*Amer. Heart Jour.* 1935, x, 425, Abstr. in *Jour. Amer. Med. Assoc.* 1935, civ, 2295; <sup>3</sup>*Amer. Jour. Med. Sci.* 1934, clxxxviii, 231; <sup>4</sup>*Glasgow Med. Jour.* 1934, exxii, 419; <sup>5</sup>*Arch. of Internal Med.* 1935, lv, 917; <sup>6</sup>Abstr. in *Jour. Amer. Med. Assoc.* 1935, civ, 1666; <sup>7</sup>*Amer. Jour. Med. Sci.* 1934, clxxxviii, 842; <sup>8</sup>*Ibid.* 498; <sup>9</sup>*Arch. of Internal Med.* 1935, lv, 86.

**EMBOLISM.** (See BLOOD-VESSELS, SURGERY OF; FAT EMBOLISM; PULMONARY EMBOLISM.)

## EMPYEMA.

*A. Tudor Edwards, M.Ch., F.R.C.S.*

**Recurrent Empyema.**—The problem of the recurrent empyema is a much more important one than is commonly recognized. Recurrence may occur at any time from a few weeks to many years after the closure of the original empyema wound.

R. II. Meade<sup>1</sup> points out that the symptoms may be variable, but are usually vague and often ascribed to an acute cold. When cough is present tuberculosis or other chronic pulmonary condition is often suspected. Pains in the same side as the chronic empyema suggest pleurisy. Of 14 cases, 12 had signs of inflammation localized to the site of the original empyema drainage scar when admitted to hospital; 10 had evidence of empyema necessitatis; in only 2 was there a definite bronchial fistula.

When considering the treatment of this condition early recognition is of considerable importance, although X-ray examination may fail to give positive information. The most valuable measure is aspiration in the neighbourhood or through the scar. After the acute stage has been dealt with by drainage, more extensive operations are generally required to obliterate the larger cavities, and unless they are adequately performed, further recurrences are likely to eventuate.

The majority, if not all, of these cases of recurrent empyema are the result of incomplete healing of the primary cavity, and they can be largely prevented if acute empyemas are not considered to be completely healed until the two pleural layers are in apposition throughout.

**Tuberculous Empyema.**—J. Eloesser<sup>2</sup> introduces a method of producing a valvular opening into the chest in cases of tuberculous empyema requiring drainage. He advises its use in cases in which there is consistently high swinging temperature with symptoms of toxicity, which are usually, but not invariably, secondarily infected. In Eloesser's experience, syringe aspiration and irrigation of the pyothorax cavity with antiseptics rarely leads to cure, although temporary alleviation is not uncommon. Likewise, the indwelling drainage tube often tends to keep up fever and sepsis. The operation he recommends has been devised to obviate the use of a drainage tube, and to encourage expansion of the collapsed lung, for which reason it is not applicable to those empyemas in which the lung is so badly affected that expansion to any degree seems inadvisable. For the purpose it is essential to have records of skiagrams taken previously to the development of the empyema.

The technique of the operation consists in the reflection of a U-shaped flap of skin and subcutaneous tissue halfway between the posterior axillary line and the line of the inferior scapular angle. The base is about 2 in. wide and lies about one rib higher than the bottom of the empyema cavity. It is about  $2\frac{1}{2}$  in. long, the length of two rib-breadths and their intercostal spaces, long enough to reach into the pleural cavity without the least tension, and longer, therefore, in fat patients than in thin ones. The rib underlying the base of the flap is resected in extent equalling the width of the flap. The pleura is opened after injection of the intercostal nerve with alcohol, and the flap turned in and sutured to the parietal pleura. The edges of the skin defect are approximated with a few silkworm-gut sutures. This operation apparently results in a valve action; each cough or rise of intrapulmonary pressure expels a little air from the pleura and causes a gradually increasing negative pressure in the empyema cavity, as it is more difficult for air to enter than to escape. This valve remains open until the lung reaches the chest wall, after which it closes spontaneously.

J. Rosenblatt<sup>3</sup> reports the clinical course and end-results in 21 cases of tuberculous empyema treated by conservative measures. In 19 of these the patient was under treatment by artificial pneumothorax for active pulmonary tuberculosis, and in 2 others tubercle bacilli were found in the sputum at some time during treatment. Eleven patients recovered and 10 died. Treatment consisted in aspiration followed by air replacement, after which 2 to 3 c.c. of a saturated alcoholic solution of methylene blue were left in the pleural cavity. The author is of opinion that in some cases the condition of the underlying lung may require thoracoplasty.

R. H. Macdonald<sup>4</sup> classifies tuberculous empyema into two groups: (1) Tuberculous empyema; and (2) Tuberculous empyema with secondary infection. Mention is made in this paper of Hedblom's classification, which would appear preferable, namely: (1) Primary, i.e., without clinical or other evidence of associated pulmonary tuberculosis; and (2) Secondary, where there is a clinically recognizable active pulmonary lesion. The decision to apply surgical treatment is determined in the main by the condition of the underlying lung. Macdonald points out the necessity of differentiation between pyogenic and tuberculous empyemata.

In sanatoria in his State prior to 1925 all cases of tuberculous empyema were treated with aspiration, with or without air replacement, by injections of antiseptics, and, when secondarily infected, by open drainage. When these cases were reviewed, in the severe mixed infection type with bronchial fistula, 13 in number, 10 died, 9 of the empyema and 1 from progressive pulmonary disease. Where rib resection had been done before or after admission, also 13 in number, 12 died and 1 was well after five years of treatment.

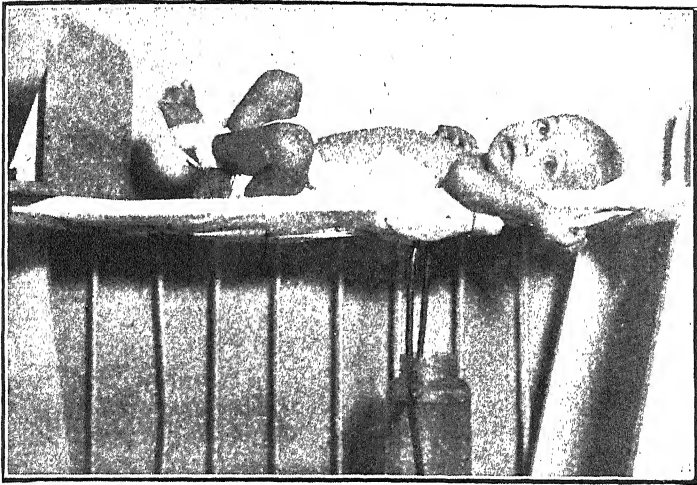
The present report includes 6 cases of severe mixed type in which bronchial fistulae were present at the time of operation. All these were submitted to thoracoplasty, and were discharged from hospital with cavity obliterated and bronchial fistula healed. Of 8 patients, with external drainage on admission, submitted to thoracoplasty, complete obliteration of the cavity resulted in 6, and 2 had small sinuses on discharge. The results of treatment in these 14 patients as a result of thoracoplastic measures show 10 well and working, 1 improved, and 1 too recent to classify; 1 is unimproved, and 1 died after operation.

REFERENCES.—<sup>1</sup>*Ann. of Surg.* 1935, ci, Jan., 559; <sup>2</sup>*Surg. Gynecol. and Obst.* 1935, lx, 1096; <sup>3</sup>*Jour. of Thor. Surg.* 1934, iii, 422; <sup>4</sup>*Surg. Gynecol. and Obst.* 1935, lx, Feb., 216.

*PLATE XXIII*

ACUTE EMPYEMA IN CHILDREN

(R. R. FITZGERALD)



Fitzgerald's method of closed intercostal drainage. The child lies on a Bradford frame with foot-rests. Two Pezzer catheters emerge from the chest and enter a jar of boracic acid lotion.

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**EMPYEMA, ACUTE, IN CHILDREN.** *John Fraser, Ch.M., F.R.C.S.Ed.*

C. R. Steinko<sup>1</sup> submits a report on 310 cases. In the total series the general mortality was 22.6 per cent, while the operative mortality was 15.8. The influence of age on mortality is well illustrated, for, while the death-rate in the first year was 71 per cent, in the period between 8 and 9 years not a single patient died, though 21 patients were included in this group. The importance of pneumonia as the introductory infection is shown by the fact that it existed in 72 per cent of all cases, and as an additional evidence of this association the author draws attention to the fact that the mortality figures for pneumonia and empyema are practically identical over a ten-year period. In an analysis of the success attending various types of operation the premier place is given to rib resection, the associated mortality being 11.9 per cent. An important exception must be recognized, however, and it is that in infants less than a year old intercostal drainage is the procedure of choice.

J. V. Bohrer<sup>2</sup> has abandoned the use of the Wolff bottle as a means of securing expansion of the lung, because he believes that this procedure has no real value. He asks the question: "What is it that secures ultimate expansion of the lung?" He believes the true answer to be that expansion occurs as the result of cohesion of granulating surfaces between the visceral and parietal layers of the pleura—in other words, that the lung is actually dragged outwards as the result of attachment of its pleural surface to the chest wall. He insists on the importance of avoiding an open pneumothorax in young children, for the particular reason that they have but a low vital capacity at the best, so that a further reduction may well be the factor which explains the high mortality associated with operations on such cases.

A practical and therefore helpful article is one contributed by R. R. Fitzgerald.<sup>3</sup> After pointing out that delay in the operative treatment of these cases is dangerous because of the complications which may arise and the irreparable damage which the lung may receive, he asks the essential and pertinent question: "When should operation be done?" The answer in his opinion is "as soon as the pus is under positive pressure, and signs of consolidation of the lung have disappeared". The ideals for which he strives are "to remove just sufficient of the pus to allow the expanding lung to come into contact with and adhere to the chest wall, and to use a closed method that will re-expand the lung within a period of five days."

The summary of the technique which Fitzgerald employs is as follows. An incision 1 in. long is made over the ribs below the space to be drained, the skin is then slid upwards and the intercostal structures are separated from the upper border of the lower ribs. By this means a valvular opening is secured. An exploring needle confirms the presence of pus, the pleura is then incised, and the opening immediately plugged with the tip of the finger. Two mushroom catheters (Pezzer) are introduced into the empyema cavity, every precaution being taken to prevent the entrance of air. Two catheters are used in order that subsequent irrigation may be carried out, and to ensure an opening for drainage in case blockage of one of the tubes should occur. The tube ends are temporarily closed by screw clamps. Gauze soaked in sterile liquid paraffin is packed tightly between the tubes, and the skin margins and packing are transfixed by a large needle carrying a silk suture, which is tied between the tubes to provide an air-tight closure, and the parts are thereafter dressed with gauze kept in place by strips of adhesive plaster. The child is nursed upon a Bradford frame (*Plate XXIII*), a hole having been cut in the canvas to allow the exit of the tubes. The tube ends are submerged under the surface of a solution of boric acid, and the fluid level is kept at a distance of 10 cm. below the wound in an attempt to create a normal negative tension in the chest

cavity. A few hours after operation one of the tubes is unclamped for increasing intervals of time, and irrigation is begun on the second day. In a total of 36 cases treated on these lines the mortality was 11 per cent.

Within recent years we have come to appreciate what may be termed the fundamentals in the operative treatment of empyema, and the significance of these is even more evident in children than in adults. The important points are: (1) Empyema rarely (if ever) demands immediate operation in the sense of securing evacuation of the pleural space by thoracotomy. (2) In practically every instance repeated aspiration should be the introductory treatment. By this means symptoms are relieved, the effusion is localized, subsequent operation is rendered safer, and in certain cases may be avoided altogether. (3) Thoracotomy should be reserved for cases which are definitely localized in their distribution, and the operation should be performed in such a way as to reduce to a minimum the occurrence of pneumothorax.

REFERENCES.—<sup>1</sup>*Ann. of Surg.* 1935, ci, Jan., 617; <sup>2</sup>*Ibid.* 1934, c, July, 113; <sup>3</sup>*Canad. Med. Assoc. Jour.* 1934, Nov., 479.

### ENCEPHALITIS, EPIDEMIC.

Macdonald Critchley, M.D., F.R.C.P.

PROGNOSIS.—A valuable paper by Sir Arthur J. Hall<sup>1</sup> upon this subject deserves careful study. His unusually large experience of the disorder, together with the excellence of his follow-up system, makes his conclusions particularly valuable.

The mortality of epidemic encephalitis during the acute stage probably lies in the neighbourhood of 25 or 30 per cent. Published figures differ very widely indeed, but the possibility of error in the data is considerable. An attack of encephalitis is more often fatal in the elderly and also in infants. In the Sheffield epidemic of 1924 the death-rate was high in cases with early respiratory symptoms (tachypnoea) and low in cases with abdominal myoclonus as the chief symptom. As recorded in the MEDICAL ANNUAL for 1931 (p. 172), F. Roques<sup>2</sup> found that the acute attack was of graver outlook in pregnant women, the case mortality being 42 per cent.

The expectation of after-effects does not necessarily tally with the severity of the original infection, although it is comparatively rare for a complete recovery to follow a severe acute attack. Of 300 acute cases observed during the 1924 epidemic in Sheffield, only 18 per cent have made a total recovery.

Prognosis of the various sequelæ should be considered separately.

A *Parkinsonian syndrome*, once established, never clears up entirely. Complete—or almost complete—arrest of symptoms may occur, however. Most cases grow worse—at very diverse rates. The rate of advance is usually a matter of years. Of 212 cases of post-encephalitic Parkinsonism alive at the end of ten years, 70 per cent are quite able to look after themselves; 18·5 per cent are partially dependent, and 11·5 per cent wholly dependent, upon others for getting about, feeding, and dressing themselves. Tremor, once established, persists and tends to become worse. No known treatment is of permanent avail. The expectation of life in Parkinsonians can be estimated only approximately: 75 per cent of the cases may be expected to live ten to fifteen years. Of the cases which die within that period, the termination in two-thirds is expected, and is directly due to the disease. A condition of progressive emaciation and helplessness is the final picture in such cases, and a terminal septic infection may be the immediate cause of death.

The unusual but interesting *sleep-disorders* which may follow epidemic encephalitis usually clear up within a year of the acute attack, whether treated or not.

*Respiratory disorders* also tend to clear up whether treated or not. Of 29 cases studied in 1928, W. A. Turner and M. Critchley<sup>3</sup> found a cessation of symptoms or considerable improvement in one-half, while an equal number showed no change over a period of time extending up to three years. Two patients had died while still showing respiratory disorder.

*Polyuria* disappeared altogether in one case within a year, though severe Parkinsonism subsequently developed.

The presence of *epileptiform attacks* does not materially add to the gravity of the prognosis. The fits do not tend to become worse.

*Psychological changes*, if present during the acute attack, or soon after, may disappear, though physical symptoms may advance. G. A. Borthwick<sup>4</sup> has found that mild cases of disordered conduct in children improve under institutional regime, but that no real improvement is to be anticipated in the severer cases.

*Oculogyric crises* vary considerably as to their persistence. They may certainly continue to occur for ten years after the onset.

REFERENCES.—<sup>1</sup>*Lancet*, 1935, ii, July 20, 147; <sup>2</sup>*Epidemic Encephalitis in Pregnancy, Labour and the Puerperium*, Middlesex Hosp. Press, London, 1928; <sup>3</sup>*Jour. Neurol. Psychopathol.* 1928, viii, 191; <sup>4</sup>"Encephalitis Lethargica", *L.C.C. Report No. 2811*, 1931.

**ENCEPHALITIS, TETRA-ETHYL LEAD.** (See TETRA-ETHYL LEAD ENCEPHALITIS.)

**ENTERIC FEVER.** (See PARATYPHOID FEVERS; TYPHOID FEVER.)

**EPILEPSY.** (See INTRACRANIAL TUMOURS.)

## ERYSIPELAS.

J. D. Rolleston, M.D., F.R.C.P.

**EPIDEMIOLOGY.**—A. L. Hoyne<sup>1</sup> states that the mortality among 1193 cases of erysipelas admitted to the Cork County Hospital, Chicago, from 1929 to 1933 inclusive was 13.4 per cent. The disease was most prevalent in the spring, and its frequency declined in the summer, but increased in the autumn. The mortality was highest at the two extremes of life, being 39.1 per cent in the first year and 42.8 per cent between 76 and 85. Although men are more liable to injury and therefore to erysipelas, the ratio was less than 2 to 1 in favour of males. Sex appeared to play no part in the fatality rate. In 85.6 per cent the erysipelas began on the face or head, but in less than 60 per cent was there a history of injury.

**SYMPTOMS AND COMPLICATIONS.**—P. F. Stookey, C. R. Ferris, H. M. Parker, L. A. Searpellino, and K. E. English,<sup>2</sup> who record three illustrative cases in men aged 28, 40, and 74 respectively, state that *ulcerative lesions* in the course of erysipelas are an extremely rare occurrence. The ulcers in their cases were present in the loose areolar tissues about the eyes. In each case a staphylococcus with dermo-necrotic and hæmolytic properties was isolated from the lesions. The necrotizing factor was contained in a bacteria-free filtrate, and proved lethal to rabbits when administered intravenously. All the patients recovered.

According to D. Dupertout<sup>3</sup> there are two forms of *gangrenous erysipelas*, a primary form due to local ischæmia and a secondary or late form caused by association of *Streptococcus erysipelatosus* with other organisms, especially *B. terebrans* or *Staphylococcus aureus*. The prognosis depends more on the complications and the patients' general condition than on the presence of the gangrene.

**TREATMENT.**—Hoyne<sup>1</sup> did not find convalescent serum to be of any value,

but obtained the best results by local application of *erysipelas streptococcus antitoxin cream*. Among 417 cases so treated the mortality was 11.5 per cent, which compared favourably with that obtained by any other form of treatment.

P. Barré<sup>4</sup> obtained the best results by use of *sulfarsenol*, which can be administered subcutaneously, intramuscularly, or intravenously. The dose depends upon the age of the patient, the state of his heart, liver, and kidneys, and the severity of the attack. As a rule the dose for adults is 12 cgrm., which may be increased to 6 cgrm. daily for four injections, while that for the child is  $\frac{1}{2}$  cgrm. per kilo of body weight, only one injection being given in 48 hours.

REFERENCES.—<sup>1</sup>*Med. Record*, 1935, cxli, 132; <sup>2</sup>*Jour. Amer. Med. Assoc.* 1934, ciii, 903; <sup>3</sup>*Thèse de Paris*, 1935, No. 287; <sup>4</sup>*Ibid.* No. 57.

### ERYTHEMA ARTHRITICUM EPIDEMICUM.

J. D. Rolleston, M.D., F.R.C.P.

SYMPTOMS.—Under the title of 'Haverhill fever', from its occurrence in Haverhill, Massachusetts, or of 'erythema arthriticum epidemicum', E. H. Place and L. E. Sutton<sup>1</sup> describe an apparently new clinical entity characterized by an abrupt onset, an eruption resembling measles or rubella, with a distribution which is often scanty, chiefly affecting the extremities, and a tendency to hæmorrhage into the lesions and inflammation of the joints, not infrequently of long duration. Recovery takes place in from one to two months, but a small number of patients have persistent joint symptoms. No deaths have occurred.

ETIOLOGY.—The disease, according to Place and Sutton, is undoubtedly spread by the milk-supply. An organism, *Haverhillia multiformis*, appearing chiefly as a rod with a knob at any part of it, was found in blood cultures. Agglutinins were present in the blood of infected persons and absent from controls. Skin reactions to killed suspensions were present in 83 per cent of patients tested late in convalescence and absent from controls.

REFERENCE.—<sup>1</sup>*Arch. of Internal Med.* 193, liv, 659.

### ERYTHEMA INFECTIONOSUM.

J. D. Rolleston, M.D., F.R.C.P.

EPIDEMIOLOGY.—A. R. Lozano<sup>1</sup> reports the first cases of this disease to be described in Spain, in children aged from 3 to 14 years. He maintains, however, that there have been numerous cases in Madrid which have not been recognized, as he has met with many in private practice, and the mild character of the complaint does not require medical attention. His cases occurred in different parts of Madrid, but most of them showed a distinctly familial character. All made a good and uncomplicated recovery.

REFERENCE.—*Arch. españ. de Ped.* 1934, xviii, 65.

### ERYTHEMA NODOSUM.

J. D. Rolleston, M.D., F.R.C.P.

SYMPTOMS.—H. Sandra<sup>1</sup> states that among 120 cases of erythema nodosum seen at a tuberculosis dispensary in the course of the last few years 30 were in males and 90 in females. The ages ranged from 3 to 51 years. Three patients had two attacks, the intervals between the two being 2 years and 10 months, 4 months, and 4 years respectively. There were four examples of the disease occurring in the same family. The Pirquet reaction was positive in 101 and negative in 19. Like Wallgren and others, Sandra holds that in the great majority of cases erythema nodosum is tuberculous in nature, and urges that a search for it should always be made in the campaign against tuberculosis, especially in dispensary practice.

An outbreak of 16 cases of erythema nodosum of apparently tuberculous origin is recorded by C. de Murtas<sup>2</sup> in a school in Italy, where the disease is less



common than in northern countries. The Pirquet reaction was positive in all, and in every patient in which an X-ray examination was made signs of hilar involvement and enlargement of the tracheo-bronchial glands were found.

On the other hand, tuberculosis could be excluded in the cases reported by D. v. Moritz,<sup>3</sup> in boys aged  $7\frac{1}{2}$  and 9 years who developed erythema nodosum in the third and fourth weeks respectively of scarlet fever. The tuberculin test was negative in both, and neither showed any abnormal signs on X-ray examination of the chest. These two cases, however, were the only two examples of negative tuberculin reactions among 53 cases of erythema nodosum seen at the Budapest University Children's Clinic during the period 1930-4. A non-tuberculous origin is also indicated in four cases of erythema nodosum reported by G. Slot,<sup>4</sup> 3 of which were in women and one in a boy aged 10, in which rapid improvement followed injection of 10 to 20 c.c. of antistreptococcal serum.

L. B. Elwell<sup>5</sup> records a case of recurrent erythema nodosum in a woman aged 29, in whom the attacks commenced with axillary adenitis, the maximum intensity of the reaction being associated with suppuration of the glands. Immediate improvement followed evacuation of the pus, but relief was not permanent until every focus of dental sepsis was removed. There was evidence that neither the tubercle bacillus nor the hæmolytic streptococcus was responsible for the infection.

REFERENCES.—<sup>1</sup>*Nederl. Tijds. v. Geneesk.* 1935, lxxviii, 13; <sup>2</sup>*Clin. Pediat.* 1935, xvii, 271; <sup>3</sup>*Arch. f. Kinderheilk.* 1934, ciii, 227; <sup>4</sup>*Lancet*, 1934, ii, 600; <sup>5</sup>*Brit. Med. Jour.* 1935, i, 974.

## EXANTHEMA SUBITUM.

J. D. Rolleston, M.D., F.R.C.P.

SYMPTOMS.—M. J. Wallfield,<sup>1</sup> who reports a case of exanthema subitum with encephalitic onset, remarks that although numerous examples of an encephalitic or meningeal syndrome preceding or accompanying an acute infection such as measles, varicella, vaccinia, whooping-cough, and diphtheria have been recorded, no previous case of encephalitis in exanthema subitum has been published. His patient was a boy aged 12 years who was admitted to hospital with a history of vomiting, fever, headache, vertigo, and nuchal rigidity of two days' duration. The spinal fluid on lumbar puncture was clear and the pressure only slightly increased. A typical rash appeared after a high fever of three days' duration, and rapid and uncomplicated recovery took place.

H. Rydén<sup>2</sup> reports an outbreak of eight cases of typical exanthema subitum in infants aged between  $3\frac{1}{2}$  and 10 months, which occurred in the Flensburg Children's Hospital at Malmö. In all the cases the disease ran a mild course. Unlike Rietschel, Abh, and others, who regard it as a manifestation of influenza, Rydén maintains that exanthema subitum is a disease *sui generis*.

REFERENCES.—<sup>1</sup>*Jour. Pediat.* 1934, v, 300; <sup>2</sup>*Acta Pediat.* 1935, xvii, 498.

## EXOMPHALOS. (See HERNIA, UMBILICAL.)

## EXOPHTHALMIC GOITRE. (See THYROID SURGERY.)

## FACIAL PARALYSIS, RECURRENT.

Macdonald Critchley, M.D., F.R.C.P.

The text-books do not pay adequate attention to those cases in which a facial paralysis of peripheral type relapses, or develops later upon the opposite side. Recurrences of this type are usually encountered in children. There is a tendency in such cases not to diagnose Bell's palsy, but rather to suspect

some ulterior nervous affection. The possibility of inherited syphilis, diphtheritic paralysis, facioplegic migraine, and uveoparotid paralysis must be borne in mind.

Since the paper by M. Bernhard<sup>1</sup> thirty-seven years ago, there have been but few references in the literature to this subject. A recent note by H. R. Merwarth<sup>2</sup> recording 19 personal cases is therefore of interest. According to this author, recurrent facial palsy is etiologically comparable with Bell's palsy. This in turn is associated by the author with the traditional rheumatic 'Fallopian neuritis'. Of the 19 cases reported, there was no particular age incidence, the youngest victim being 11 and the oldest 84. Both sexes were equally affected. The interval between the two attacks of facial paralysis varied from 3 weeks to 30 years. Either the same or the opposite side of the face may be implicated in the second attack of paralysis. Moreover, in each of two patients who suffered three attacks of paralysis, two of the three attacks recurred on the left side. The actual frequency of recurrent facial palsy may be gleaned from the figures taken from the author's own practice. Of a total of 192 cases of 'rheumatic' or Bell's palsy, recurrence took place in 15 (7·7 per cent). Out of 293 cases of peripheral facial palsy of all types, there were 19 examples of recurrence (6·4 per cent).

REFERENCES.—<sup>1</sup>*Neurol. Zentralb.* 1899, xviii, 146; <sup>2</sup>*Amer. Jour. Med. Sci.* 1935, clxxxix, Feb., 270.

#### FACIAL PARALYSIS: SURGICAL TREATMENT.

*Geoffrey Jefferson, M.S., F.R.C.S.*

A. B. Duel,<sup>1</sup> of New York, describes the treatment of inlay grafting of the facial nerve within the facial canal perfected by himself and Sir Charles Ballance as the result of their animal experimentation. They evolved a method of direct repair of the facial nerve by introducing a piece of freshly excised graft from another nerve into the gap made by the removal of a piece of the facial nerve in the aqueduct. They discovered that any nerve would suffice for this purpose—that is, that it did not matter whether it was motor or sensory. Duel describes his experiments with clinical material, the first case operated upon being an infant 18 months old with a facial paralysis following a mastoid operation. The facial nerve was absent from a level just below the horizontal semicircular canal to the posterior border of the parotid gland twenty-four days after an injury. A graft 27 mm. long was employed, the central end being laid up against the proximal end of the divided facial nerve and the distal sutured by one strand of 6 nought silk. The patient eventually recovered the use of her facial muscles. The second case was a woman aged 34 operated upon eleven months earlier for a radical mastoid operation: 37 mm. of injured facial nerve was removed from the tympanum to a point well outside the stylo-mastoid foramen and an inlay graft placed to bridge the gap. She eventually made a fair, but not perfect, recovery. Slight infection seemed to be no bar to the success of the operation. Duel reports 69 operated cases, 40 of them having been grafted in the Fallopian canal. The affected gap was on the average over 20 mm. in length (the shortest 7 mm., the longest 40 mm.).

Duel was puzzled by the long delay in return of function after inlay grafts, and thought that it might in some degree be due to the obstruction caused by the graft whose axonal sheaths were not empty. It occurred to him and Ballance to try the effect of using degenerated nerve for the graft. The plan was tried first on monkeys, the anterior femoral cutaneous nerve being cut and allowed to remain in its bed for varying periods from eight to thirty-five days, so that Wallerian degeneration could take place. When portions of the nerves treated in this manner were used as grafts facial responses were

restored in a quarter to half the time formerly required by fresh grafts. Duel in this paper gives details of the technique of the nerve-inlay operation. He thinks that it can always be done and that if there is galvanic response in the muscles a favourable result will be obtained, the quality depending on the condition of the muscle. He goes on to describe his observations of *Bell's palsy*, and points out that although it is the custom to give a good prognosis in these cases, not all recovered with a perfectly balanced and perfectly mobile face. He has discovered that in the most favourable cases faradic response is not lost and that Wallerian degeneration does not always occur. There is still room for observation on this point. From 15 to 20 per cent, according to Duel, undergo a violent toxic infection with a severe inflammatory reaction in which the axons are choked out of existence. Within a day or two faradic response disappears and in those cases regeneration is never complete. He suggests that when this happens the case should be at once explored by an open operation through the mastoid, the facial canal defined, its wall gently removed, and the sheath of the nerve slit up so as to decompress it. This suggestion he attributes to Ballance. Duel proved by experiment on monkeys that the incision of the sheath did no harm. He has since applied the method to human beings, and even in old-standing cases claims that the incision of the sheath has resulted in very marked improvement. He reports four cases with Bell's paralysis, three of whom were operated upon. The palsy had lasted for 2, 2, and 10 years. In one case an inlay graft was used.

Sir Charles Ballance,<sup>2</sup> in a separate communication, describes the experimental work which he undertook with Duel and gives an admirable survey of the experimental side of the problem.

H. Gillies<sup>3</sup> describes his experiences with fascia-lata grafts in the operative treatment of facial paralysis. Fascia-lata bands inserted subcutaneously contribute, of course, no movement to the paralysed face, but the face in repose and in action is balanced by the support of the fascia so that the over-action of the normal side no longer produces the somewhat grotesque movements which add to the facial deformity in these cases. Thin strips of fascia lata from the thigh are passed on a long needle through small incisions on the face. The strips should embrace the fibres of the non-paralysed muscle in the upper and lower lip. Latterly Gillies has been adding strips of muscle from the temporalis or masseter with their nerve-supply preserved and has tried attaching them to the fascia-lata strip, but it is difficult for the patient to make use of this additional motility. The great problem which confronts the operator intent on plastic repair of facial paralysis is the closure of the eye, rather than movements of the angle of the mouth. To improve the eye closure Gillies employs a slip of temporal muscle and its fascia taken from the anterior end of the temporalis. By splitting the fascia he has found that it can be made sufficiently long for a strip to be passed to the upper and lower lids to meet at the inner canthus. When the temporal muscle contracts, this little flap squeezes the two eyelids together. Sepsis is very apt to creep in and vitiate the result in some degree, and the bands must not be passed too near to the mucous membrane of the mouth. Gillies believes that a very marked improvement in cosmetic effect has been obtained in all his cases, but in view of the lack of muscle response the facial results cannot be compared with recovery in nerve function.

There is no doubt that the work of Ballance and Duel, applied with wisdom and thoroughness, ought to render most plastic operations for facial palsy unnecessary. There will always be a few cases in which the facial muscles are hopelessly degenerated, or in which the facial nerve has been paralysed

at its nucleus, or the nerve divisions destroyed by some unusual disease or injury of the parotid or face, but if the facial nerve can be isolated and its injured portion identified at operation, a degenerated nerve-inlay graft is the proper method of treatment.

REFERENCES.—<sup>1</sup>*Brit. Med. Jour.* 1934, ii, 1027; <sup>2</sup>*Proc. Roy. Soc. Med. (Sect. Otol.)*, 1934, xxvii, 1367; <sup>3</sup>*Ibid.* 1372.

### FAT EMBOLISM.

*Sir W. I. de C. Wheeler, F.R.C.S.I.*

This condition is frequently mentioned as a complication of fractures and other injuries, and is said to follow damage to adipose tissue in any part of the body. If a large quantity of fat gains access to the blood-vessels, a fatal result may follow. The serious cases may take the form of pulmonary fat embolism. The fat lodges in the arterioles and capillaries of the lungs after traversing the veins, the right heart, and pulmonary artery. The emboli may be forced into the pulmonary veins, the left side of the heart, and the aorta, and reach all over the body. Most of these emboli reach the brain, producing coma and death.

The clinical diagnosis of fat embolism may be easily missed. B. M. Vance<sup>1</sup> mentions a case of compound fracture of the tibia and fibula which developed deep coma with incessant tonic spasms of the arms and legs. His respirations reached 52 with signs of pulmonary oedema. The pulse-rate was 190 and the temperature before death 107° F. At the post-mortem sections of the lungs, kidney, and brain were stained for fat, using Sudan III and osmic acid. Fat emboli were found in all the sections. Vance quotes Groendahl<sup>2</sup> as stating that there are two forms of fat embolism: (1) The type in which the patient dies suddenly a few hours after the injury in severe dyspnoea, cyanosis, and pulmonary oedema. This type is rare clinically. (2) The type in which the onset is more gradual. The fat emboli enter the circulation at intervals and accumulate in the lungs until the pulmonary circulation is impeded. There is increasing dyspnoea, and death after a few hours. From these observations it follows that if asphyxia and dyspnoea follow an injury such as fracture, fat embolism is the likely diagnosis. Chronic pulmonary or cardiac disease would reveal the same picture and in such cases only necropsy would clear up the real condition. Cerebral fat embolism is more apparent. A period of quiescence after the injury followed by a lapse into coma coincident with petechial hæmorrhages over the front of the upper chest and neck is a fairly characteristic syndrome. In some cases the diagnosis is confused by concurrent injuries to the head.

TREATMENT.—The treatment of fat embolism is preventive. The greatest factors in the production of the condition are disturbances at the site of fracture in the early post-traumatic period.

REFERENCES.—<sup>1</sup>*Amer. Jour. Surg.* 1934, xxvi, Oct., 27; <sup>2</sup>*Deut. Zeits. f. Chir.* 1911, iii, 56.

### FEET, PAINFUL.

*E. W. Hey Groves, M.S., F.R.C.S.*

*K. H. Pridie, F.R.C.S.*

Pain is always mysterious, but never more so than when associated with the feet. Why is it that feet which have exactly the same appearance should differ so widely, one being painless and the other painful? This applies both to feet which have a good shape and to those which are deformed.

**Neuroses and Vasomotor Changes.**—Two factors have always to be borne in mind which are quite apart from, or additional to, gross deformity or disease. One of these is mere neurosis and the other vascular disease. The foot is not so often the seat of neurosis as the pelvis, abdomen, or head, but nevertheless

it is sometimes. This type of neurotic pain is usually in women ; it affects the anterior arch and is diagnosed as metatarsalgia or Morton's disease. In extreme cases it defies all treatment, and if an injudicious course of operations is undertaken (excision of metatarsal heads, neurectomy, nerve injections, amputation of the foot), the patient becomes steadily worse after each surgical procedure and brings discredit upon all who have treated her. The other cause of pain which is overlooked is vascular or sympathetic in origin. One has only to recall the intense agony associated with many forms of vascular gangrene to realize how potent a factor vascular or vasomotor change may be. The patients are usually well over middle age, and will show evidences of obstructed circulation, e.g., cold feet or chilblains. It is possible that if the vessels are not actually calcified (which can readily be proved by the X rays) this type of painful foot may be relieved by some form of sympathectomy.

**Flat-foot and Foot-strain.**—Having excluded these two causes of pain, neurosis and vasomotor changes, we must consider the various types of foot deformity as causes of pain. And first of all there is the commonest of all, viz., *flat-foot*. A. S. B. Bankart<sup>1</sup> has done great service in pointing out that mere flatness of the standing foot is not a morbid condition. In fact the mobile flat-foot is the normal healthy foot found in all primitive, unshod people, in children, and in professional dancers. It is not only futile but harmful to provide 'arch supports' for people with such feet. It is only when a valgoid, i.e., an abducted and pronated position, is acquired that treatment by wedging is necessary.

The normal healthy foot is flat when the individual stands, but the arch appears directly he begins to walk or raise himself on his toes. In many people, however, owing to tight shoes, lack of exercise, and muscular debility, the time comes when the flat-foot cannot be raised to its active arched form. This may be due to mere muscular weakness or it may be associated with various changes in the tarsal ligaments or with actual adhesions. Or the same thing is often seen in feet which present quite a normal arch, but in which the arch cannot be flattened when the patient stands. In other words, the foot has acquired an arch which cannot be flattened. This type of painful foot is best described as one of *postural strain*. It is painful because the tarsal joints are stiff—because it cannot be flattened, not because it is flat. Most of the pain is situated round the astragalo-scapoid joint or on the outer margin of the foot below and in front of the external malleolus. In early cases it should be treated by massage and active movements, e.g., skipping ; but in most cases which come for treatment at a late stage, forcible wrenching under an anæsthetic will be necessary. It may be confidently said that every case of painful foot in middle-aged or elderly people should be given this treatment without hesitation or undue delay.

Another type of painful foot is that which follows injury, some kind of sprain. Again mobility of the tarsal joints is lost or limited. This is the *traumatic foot-strain*, and it also requires forcible manipulation followed by massage and exercises.

**Painful Conditions of the Great Toe.**—These are usually the result of overstrain combined with the wearing of ill-fitting pointed shoes. The common deformity is *hallux valgus*, *hallux rigidus*, and *hallux flexus* being less common variants, often of traumatic origin. In all, the essential lesion is an osteoarthritis of the metatarso-phalangeal joint which can be readily demonstrated by the X rays. The common valgoid condition is further associated with the formation of a secondary bursa or bunion over the prominent joint. The treatment of all these conditions is the same, viz., an excision of the head of the first metatarsal. The whole articular head with its osteophytes should be

removed, and the neck of the bone rounded off and covered with a flap of fascia, which can often be taken from the adventitious bursa. The objection that this operation removes one of the main points of foot support is groundless, because this is still preserved in the sesamoid bones which underlie the reconstructed head.

**Metatarsalgia.**—This may be either diffuse or localized. The diffuse type is usually associated with claw-foot. It will require wrenching or the more radical operation described below. The localized type has pain over one metatarsal head, usually the fourth. Probably here there is too much weight being thrown on the outer part of the foot, and this may be corrected by wedging the inner side of the sole. Very often an adhesive pad of Zopla felt applied just behind the painful spot will afford great relief. If both these measures fail, the painful head of the bone may be removed. Painful and deformed little toes should certainly be removed without delay.

**Pes Cavus.**—Contrary to popular ideas, the high-arched or clawed foot is a drawback and deformity. When well marked it is a constant source of weakness and pain, and should form a definite bar to a man's acceptance in any public service. A. H. Todd<sup>2</sup> has reviewed the various theories and practices for this deformity, and has urged the adoption of a routine, rather radical operation. Pes cavus is due to a dropping of the front part of the foot, probably owing to a relative weakness of the anterior extensor group of muscles. There is no evidence of paralysis of the interossei or lumbricals, and the clawed or hammer toes are due to the alteration of the line of pull of these tendons caused by the lower position of the metatarsal heads. Further, it is important to note that there is no contraction of the tendo Achillis, although there may be a difficulty in putting the heel on the ground. If the front part of a normal foot is forcibly lowered, it is obvious that the heel will be off the ground when the toes are touching it, but to lengthen the tendo Achillis and bring down the heel would merely increase, instead of diminishing, the height of the arch. And furthermore, the resistance of the tendo Achillis is invaluable in fixing the heel when the front part of the foot is being wrenched upwards.

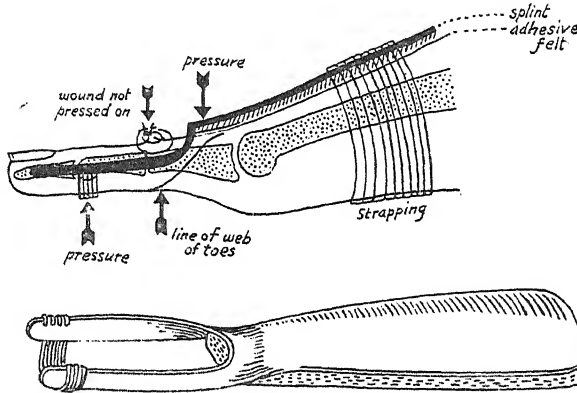
In minor degrees of pes cavus it may be sufficient to wrench or manipulate the foot, straightening the arch, and then to place an adhesive pad behind the metatarsal heads or a transverse bar in the sole of the shoe; but in the more advanced cases operation is called for to relieve both pain and lameness. The old-fashioned division of the plantar fascia is quite ineffectual, and probably in most cases the more radical operation of Steindler, by which the whole of the sole and fascia and muscles are divided from their origin at the os calcis, is also not enough. Cuneiform tarsectomy can, of course, remedy any deformity, but if this alone is relied on, much more bone will have to be removed than if the soft parts of the sole are first lengthened, and a very short weak foot will result. Todd insists that none of these methods will give permanent results, unless the forefoot is slung up so that it cannot drop. Todd's operation is done in two stages:—

**First Stage.**—A long incision is made on the inner margin of the foot from the ball of the great toe to the tuberosity of the scaphoid. The abductor hallucis is separated from its attachments and the following structures are divided: the internal intermuscular septum, sheaths of the flexor tendons, and all the secondary attachments of the tibialis posticus. All the joints on the inner margin of the foot are incised by cutting the plantar parts of their capsules, viz., the astragalo-navicular, the navicular-cuneiform, and the cuneo-metatarsal. The first-named joint should be left to the last, and as much of the correction as is possible done by forcing the foot upward at the other joints. Then an external heel incision is made as in Steindler's operation, and all the structures

which arise from the lower aspect of the os calcis are separated from that bone. It should now be possible to elevate the front of the foot and correct the high arch.

**Second Stage.**—This consists in cutting the long extensor tendons of the great toe and the common extensors, and fixing them to the necks of the metatarsal bones. This is done through three longitudinal incisions on the dorsal surface of the 1st, 3rd, and 5th metatarsals. Each extensor tendon is cut as low down as possible and is then threaded through a hole bored in the neck of the 1st, 2nd, 3rd, and 5th metatarsals (the 4th is too slender to allow of this). Each tendon is pulled tight whilst the fore part of the foot is forcibly dorsiflexed. The end of the tendon is twisted round the proximal part and sewn with fine fishing gut. Todd does not use any splint, but it will be found of great help in speedy convalescence to apply a plaster cast maintaining full dorsiflexion and supporting the plantar aspect of the toes. The cast should terminate on the dorsal aspect just short of the web of the toes. If a walking iron is incorporated in the cast, the patient will be able to get up and walk within a few days.

**Hammer-Toe.**—This condition, which generally affects the 2nd, 3rd, and 4th toes, consists in hyperextension of the metatarsophalangeal joint and flexion



Figs. 19, 20.—Creer's splint for hammer-toe. (By kind permission of the 'British Medical Journal'.)

of the first interphalangeal. It causes the toe to be 'clawed', with the result that painful corns are formed on the top of the toe on its plantar, and over the upstanding interphalangeal joint on its dorsal, aspect. Various kinds of plantar splints with dorsal straps have been devised, but none of them are satisfactory, and it is therefore better to treat the deformed toe or toes by operation. Amputation is not wise, because it leads to deflection of the neighbouring toes towards the gap.

The operation consists in excision of the first interphalangeal joint through a dorsal incision. Both the head of the proximal and the base of the distal phalanx are removed by a clean transverse saw-cut. It is better not to use cutting forceps for this, as the bones will be splintered and less likely to unite. The splinting after this operation requires care. W. S. Creer<sup>3</sup> has devised a useful splint for this purpose which is here illustrated (Figs. 19, 20). It is made of duralumin, and consists of a dorsal part curved from side to side to fit the dorsum of the foot, and two lateral pieces which embrace the sides of

the toe. If this splint is not available, the plaster cast described above for use after the operation on claw-foot is very effective. If slight dorsiflexion of the whole toe is not sufficient to keep it straight, a pad can be bandaged on to the dorsal surfaces of the toes. As in the case of the claw-foot, the use of the plaster cast and walking iron will enable the patient to walk within a day or two of the operation.

REFERENCES.—<sup>1</sup>*Lancet*, 1935, i, Feb. 2, 249; <sup>2</sup>*Proc. Roy. Soc. Med.*, 1934, xxviii, Dec., 117; <sup>3</sup>*Brit. Med. Jour.* 1935, i, March 16, 527.

## FILARIAL INFECTIONS OF THE MALE GENITAL TRACT.

Hamilton Bailey, F.R.C.S.

The filarial worm (*Wuchereria bancrofti*) in its mature stage is an inhabitant of the lymphatic system of man. P. N. Ray<sup>1</sup> says it is responsible for the six following lesions of the male genital tract:—

**1. Lymphatic Varicocele.**—This is the earliest and sometimes the only manifestation of filarial infection of the male genital tract. Usually there are no symptoms, and the early diagnosis is made only in a routine examination of the patient. The condition resembles a varicocele, but, unlike a varicocele, it does not disappear when the patient lies down. Ray advises treatment by local injection of sodium morrhuate solution.

**2. Endemic Funiculitis.**—The acute type usually ends in septicæmia due to secondary infection. This is associated with thrombosis of the pampiniform plexus, and unless early incision is made the mortality-rate is extremely high. M. N. De and K. D. Chatterjee<sup>2</sup> have shown that a hæmolytic streptococcus can be isolated from the blood and the tissues about the cord in these cases. The relationship of the filarial infection to this fulminating secondary streptococcal infection is very definite, but how and why it occurs has not yet been worked out fully. In the subacute or chronic types, which are often associated with epididymo-orchitis, the prognosis is better.

**3. Hydrocele.**—Hydroceles are found very commonly in districts where filarial infection is rife. Observers working in these areas have found that in upwards of 10 per cent of cases the hydrocele fluid contains microfilaræ.

**4. Chronic Epididymo-orchitis.**—This is liable to be mistaken for tuberculosis (*see below*).

**5. Elephantiasis of the Scrotum and Penis.**—Although this condition is associated with filarial infection, tropical elephantiasis is not necessarily caused by the parasite. Lymphatic obstruction probably plays the major rôle, and erysipeloid streptococcal infection is superadded and intensifies the course of the disease.

**6. Lymph Scrotum.**—Lymph scrotum is differentiated from scrotal elephantiasis by its reddish-brown colour and the presence of vesicles either discharging or encrusted. The discharge of chylous fluid may amount to several ounces in the twenty-four hours. It continues for several days and causes great prostration. The treatment is unsatisfactory. With rest in bed and local applications the discharge usually ceases for a time.

**Filariasis of the Spermatic Cord and of the Epididymis.**—J. C. Ferrer<sup>3</sup> has found that filarial worms produce two distinct lesions in the testicle.

**1. Filariasis of the Spermatic Cord.**—The worm lodges in the anterior part of the cord. Periodically, owing to cyclical parturition of the female, an acute hydrocele appears. The hydrocele fluid is loaded with microfilaræ. The scrotum becomes shiny and there is discomfort or pain referred to the cord. The process lasts two or three days, when a restitution occurs. With each recurring attack the hydrocele increases in size and eventually it becomes chronic. The treatment recommended by Ferrer is to *excise the anterior group*



of veins of the cord. In so doing the lymphatics harbouring the parasite will be removed. In addition, the hydrocele should receive appropriate operative treatment. It is quite unnecessary to perform orchidectomy, as has been recommended and practised in the past.

2. *Filarial Epididymo-orchitis*.—The globus major is attacked. Again, the attacks are periodical, but in this instance constitutional symptoms are severe. There is colic, nausea, and pain radiating from the scrotum to the inguinal canal and the lower abdomen. The temperature often rises to 103°. During the acute stage microfilariæ will be found in the circulating blood. The epididymis is exquisitely tender. The scrotum is only slightly œdematous on its posterior aspect and there is never a hydrocele accompanying or following this variety of the disease. As the attacks recur the globus major becomes larger and larger, until it can be felt like a marble. The outcome of these recurring attacks is necrosis of the epididymis followed either by secondary infection, or a generalized fibrosis of the epididymis containing the calcified worm. The treatment of filarial epididymitis is epididymectomy.

H. H. Young<sup>4</sup> draws attention to the great difficulty of distinguishing filarial from tuberculous epididymitis. He reports several cases of the former condition treated most satisfactorily by epididymectomy.

(See also KIDNEY, SURGERY OF—CHYLURIA.)

REFERENCES.—<sup>1</sup>*Ind. Med. Gaz.* 1934, lxix, 554; <sup>2</sup>*Ibid.* 558; <sup>3</sup>*Jour. of Urol.* 1934, xxxii, 710; <sup>4</sup>*Ibid.* xxxiii, 383.

## FILARIASIS.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

CLINICAL.—Filarial periodicity is reported on by G. C. Low, P. H. Manson-Bahr, and A. H. Walters,<sup>1</sup> the latter of whom made two-hourly counts of the embryos in 20 c.mm. of finger blood, and found the usual maximum at midnight to 2 p.m. On making the patient sleep during the day the total number of embryos remained about the same, but with nearly equal midday and midnight counts, or an 'irregular' rather than a 'reversed' periodicity. They support Manson's original view of an almost fixed filarial population which shelters in some internal part of the body during the day, rather than the alternative, which Manson considered fifty years ago, of daily simultaneous cyclical parturition; although the latter view is once more argued at length by C. A. Lane.<sup>2</sup> The first writers point out that filarial embryos can live for weeks in human blood outside the body, so why should they all die daily in the circulating blood. They also state that daily counts for weeks or months show very little variation in the nightly numbers. [The last observation is not true of Bengal filariasis, for the reviewer<sup>3</sup> found and charted great monthly increases of young embryos in the evening blood.—L. R.] Periodicity of *Dirofilaria immitis* of dogs has been investigated by E. H. Hinman,<sup>4</sup> transfusing large numbers of the embryos into the blood of uninfected dogs and showing that they lived for a long time there, so cannot be destroyed daily as Lane suggests.

*Filaria bancrofti* and *Filaria ozzardi* infections in British Guiana are compared by C. Romiti.<sup>5</sup> *F. bancrofti* infections are limited to the coastal regions and river estuaries and *F. ozzardi* ones to riverine populations of the interior, and the latter produce no symptoms or œdema, although they are frequently associated with septic infections and lymphangitis, as are *F. bancrofti* ones. The writers find that in *F. bancrofti* infections the initial pathological manifestation is exclusively found as varicolympheoce of the spermatic cord in the male, and of the utero-ovarian plexus in the female, and in a large percentage this is the only clinical lesion as long as the embryos can enter the circulation freely. This view is based on observations during over 7000 operations,

including over 1000 laparotomies. Adult worms are always found in uncomplicated varicolympocele, and when a radical operation for this condition is performed "the numbers of microfilariae in the peripheral blood decrease rapidly and they disappear completely fifteen days after operation, indicating but short duration of the life of the embryo". [But not as short as the daily cyclical parturition theory demands.—L. R.] During acute bacterial complications microfilariae disappear from the circulation owing to the ill effects of the toxins on the adult worms. The genital infection theory explains the age incidence of filarial infection, for "it is only when the sexual organs have reached maturity that *F. bancrofti* finds the normal habitat to complete its normal cycle".

Filarial lymphangitis is considered by A. W. Grace<sup>6</sup> to be entirely due to a special strain of "*B. hæmolytic streptococcus*" of the tropics, and infrequently found in temperate climates, producing an erysipelas-like lesion of the skin in which it probably resides. He thinks it meaningless to consider it a secondary invader or to regard *W. bancrofti* as in any way the cause of such lymphangitis. Filarial infections of the male genital tracts is dealt with by P. N. Ray,<sup>7</sup> who reports on the pathological changes in the fatal acute streptococcal endemic funiculitis often met with in Calcutta. Excision of a lymphatic varix is not justified on account of the risk of cellulitis, while such a lesion in the groin was converted into a firm solid mass by local injections of sodium morrhuate by him. In sections adult filariæ can be demonstrated in the testis or cord. A case of filarial orchitis complicated by hæmolytic streptococcal infection, with un ulcerated endocarditic lesions on the pulmonary valve, is reported by M. N. De and K. D. Chatterjee.<sup>8</sup> A case in which an adult *F. bancrofti* was removed from the anterior chamber of the eye is reported by S. E. Fernando.<sup>9</sup>

**Onchocerca Infections.**—J. Bryant<sup>10</sup> reports that a form of retinochoroiditis endemic in the Anglo-Egyptian Sudan as a common cause of blindness has a distribution similar to that of *Onchocerca volvulus*, which he suggests may be its cause. Punctate keratitis is one symptom. P. G. Preston<sup>11</sup> records what is apparently the first case of onchocerca infection in Kenya.

**Guinea-worm.**—V. N. Moorthy<sup>12</sup> reports finding that the bile of both fish and of man kills the embryos of guinea-worm in two to three hours and the cyclops carrier in one or two minutes. Fish fed on cyclops infected with guinea-worm embryos a fortnight before, however, showed nematode larvæ later in their intestines.

An intradermal test for guinea-worm infection is reported on by G. W. St. C. Ramsay<sup>13</sup> in Nigeria. Portions of adult guinea-worms were dried, powdered, and the lipid fraction extracted with ether. The dried residue was extracted with 0.85 per cent sodium chloride at 37° C. for four hours, and the supernatant fluid after centrifuging was sterilized by filtration and kept in amber-coloured bottles in the refrigerator. The intradermal injection of 0.25 c.c. of the 0.25 per cent saline extract gave positive results in 85 per cent of guinea-worm cases, and 84 per cent of negative ones in controls. The reaction is positive long after recovery, but may be of use in diagnosing ulcers and abscesses due to this parasite.

REFERENCES.—<sup>1</sup>*Lancet*, 1934, ii, Sept. 8, 531; <sup>2</sup>*Ibid.* Dec. 29, 1437; <sup>3</sup>*Brit. Med. Jour.* 1920, ii, 569; <sup>4</sup>*Amer. Jour. Trop. Med.* 1935, xv, May, 371; <sup>5</sup>*Trans. Roy. Soc. Trop. Med. and Hyg.* 1935, xxviii, April, 613; <sup>6</sup>*Ibid.* 1934, xxviii, Nov., 259; <sup>7</sup>*Ind. Med. Gaz.* 1934, lxi, Oct., 554; <sup>8</sup>*Ibid.* 558; <sup>9</sup>*Jour. Trop. Med. and Hyg.* 1935, xxxviii, Jan. 15, 17; <sup>10</sup>*Trans. Roy. Soc. Trop. Med. and Hyg.* 1935, xxviii, March, 533; <sup>11</sup>*Jour. Trop. Med. and Hyg.* 1935, xxxviii, April 1, 81; <sup>12</sup>*Ind. Med. Gaz.* 1935, lxx, Jan., 21; <sup>13</sup>*Trans. Roy. Soc. Trop. Med. and Hyg.* 1935, xxviii, Jan., 399.

**FISSURE IN ANO.** (*See ANAL FISSURE.*)

**FISTULA IN ANO.** (*See ANAL FISTULA.*)

## FRACTURES.

*E. W. Hey Groves, M.S., F.R.C.S.*

*K. H. Pridie, F.R.C.S.*

**The Organization of the Treatment of Fractures.**—*E. W. Hey Groves,*<sup>1</sup> in an article on this subject, points out the growing need in this country for the institution of Fracture Clinics in all the large hospitals, under the care of an orthopædic surgeon. The model scheme for an organized Fracture Clinic is set out by the Fracture Committee of the British Medical Association, and may be studied in actual working in Manchester, Liverpool, and London. Every large hospital, whether voluntary or municipal, should have such a clinic. Fracture cases must no longer be treated by casualty officers and house surgeons, whose term of office lasts only a few months, so that the case is handed on to another to finish treatment.

In some hospitals at the present time cases are admitted and receive expert attention and treatment until they are sufficiently well to be discharged, after which their treatment ceases. A typical case seen recently was one of a fractured spine which was treated at a hospital using the most up-to-date methods. The treatment could not have been better, but would appear to have been given to enable the patient to leave hospital, rather than with the intention of getting him back to work. Fifteen months after the accident the man has a rigid, useless back, and is a complete fracture wreck. After he left hospital he had no treatment and no instruction, and has not improved since the day of his discharge.

Consider what happens when a motor accident occurs in which the car is smashed and the driver's bones are broken. The car is sent to the works, and the man to hospital. The car is paid for, but the man's bones have to be mended as a matter of charity! The question of fracture organization is of social and economic importance. Groves calculates that the loss through inefficient treatment must amount to £4,500,000 to the insurance companies, and £7,000,000 to the workers in lost wages, per annum.

**Gangrene following Fractures.**—The occurrence of gangrene following a fracture, or the reduction of a fracture, is fortunately very rare, but cases have been recorded where patients suffering from senile degeneration of the arteries develop this condition. *H. Dodd*<sup>2</sup> gives an account of 35 patients, 27 of whom were men. Predisposing factors are: (1) Calcification of the arteries; (2) Syphilis; (3) Diabetes. The author points out that gangrene may follow after interruption of the blood-supply in several types of injury to the main artery. These are: (1) Complete division of the chief vessel by sharp or blunt trauma; (2) Penetration of the principal artery by a fragment of bone; (3) Contusion or rupture of the intima which leads to vascular obstruction by thrombosis; (4) Embolism by a thrombus which has become displaced. The blockage generally occurs at the bifurcation of the main artery.

Certain vessels are more prone to injury than others. A freely mobile artery can escape trauma, but those which pass through or are fixed by fascia or aponeurosis, or are close to a bone, are more prone to injury as they are unable to move away from the source of violence. The following positions are where injury is likely to occur to vessels: (1) The lower third of the femoral artery. The artery is restrained as it passes through the fibro-aponeurotic opening in the adductor magnus. (2) The bifurcation of the popliteal artery. Here, again, the vessel is anchored by the fibrous arch of the soleus. (*Fig. 21.*)

*Signs and Symptoms.*—The following indicate that there has been injury and occlusion of a main artery: (1) Arterial pulsation—there is loss of pulsation below the lesion. (2) Sensation—below the traumatized region anæsthesia or paræsthesia is a sign that there may be serious damage to the circulation. The first sign may, however, be very persistent pain throughout the entire limb. (3) Appearance—blanching cyanosis and stone coldness, later followed by blebs and blisters. (4) Paralysis—loss of muscle power and inability to move the toes. (5) Local tenderness—pain and local tenderness over a vessel suggest thrombosis.

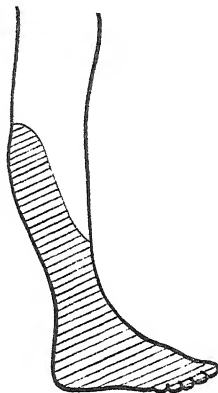


Fig. 21.—Shows the line of demarcation of dry gangrene following embolism of the termination of the popliteal artery. (By kind permission of the 'British Journal of Surgery'.)

*Radiographic Evidence (Plate XXIV).*—The presence of calcified arteries warns the surgeon that he may experience trouble following the setting of a fracture, or after applying traction.

*TREATMENT.*—The treatment may be summarized as follows: (1) Prophylaxis—all cases should be examined to determine whether the circulation is good. (2) Skin-tight plaster casts should not be used on cases with calcified arteries. (3) When the onset of gangrene is suspected it is better to "look and see, rather than wait and see". If a thrombus appears to have been formed, an embolectomy or thrombectomy is justified. (4) Large hæmatomata should be cut down on and evacuated. (5) Anastomosis of torn vessels is of doubtful value.

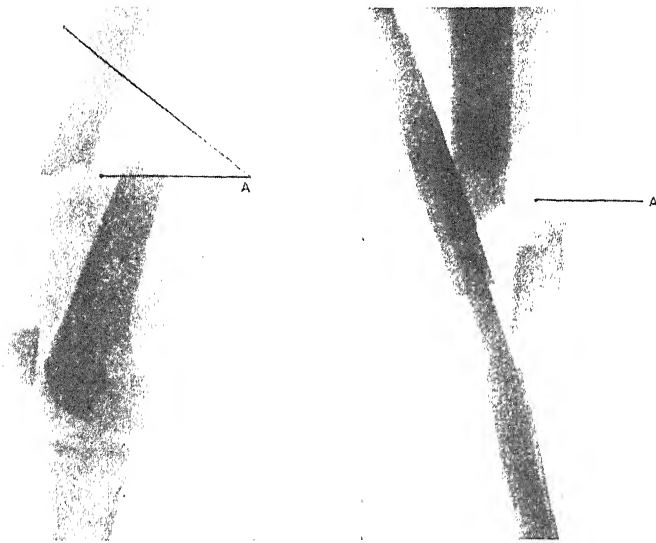
**Fractures of the Os Calcis.**—There is probably no fracture in the body which is harder to treat than a crush fracture of the os calcis. If untreated, it leads to a very painful foot, which is rigid, and walking on rough ground is impossible. The slightest unevenness or twist is apt to throw the patient. The ladder-worker, the painter, and the mason are those who are likely to incur this fracture. It is of great importance to those who work in dangerous places to have a sound foot that will not give way suddenly and throw them to destruction. These fractures are costly to the patients in lost wages and to the insurance companies in compensation. Very rarely does an untreated case get back to full work.

*DIAGNOSIS.*—The early diagnosis is of great importance if efficient treatment is to be carried out. The missed case is doomed to a painful foot, an arthrodiesis, and sometimes a below-knee amputation. This fracture should be

PLATE XXIV

GANGRENE FOLLOWING FRACTURE

(HAROLD DODD)



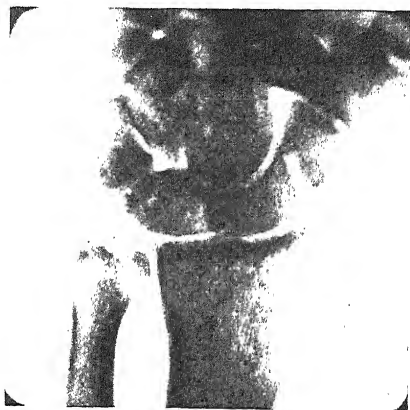
Radiograms of fractured lower third of femur. A indicates a calcified femoral artery.

*By kind permission of the 'British Journal of Surgery'*

PLATE XXV

BONE-GRAFTING FOR NON-UNION OF THE  
CARPAL SCAPHOID

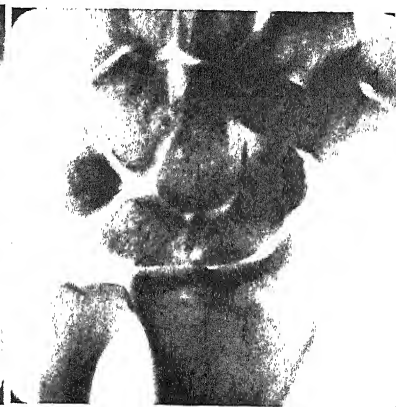
(GORDON MURRAY)



*Fig. A.*—X-ray taken two months after fracture of carpal scaphoid, showing non-union.



*Fig. B.*—Taken immediately after bone-graft operation, showing graft in position.



*Fig. C.*—Taken four months after bone-graft, showing solid union of fragments.

*By kind permission of the 'British Journal of Surgery'*

carefully looked for in any case where there is a history that the patient has fallen from a ladder or height and landed on a hard surface, injuring the foot. The following signs help to give a diagnosis: (1) Swelling and thickness of the heel as seen from the back, and the hollow below the malleoli is absent. (2) Oedema and ecchymosis round the heel. Occasionally crepitus can be felt if the fracture is very severe and is not impacted, as it so often is in these cases. (3) Spasm of the peronei, and inability to invert and evert the foot. X-rays should be taken. The two most useful views are a pure lateral one of the foot and an oblique one of the heel.

**TREATMENT.**—It is important to explain to the patient the nature of the injury and its likely consequences if not energetically treated, and that even after the most favourable circumstances there is liable to be some permanent disability.

C. R. G. Forrester,<sup>3</sup> of Chicago, in an excellent treatise on this matter, recommends the following procedure. The skin and soft tissues are allowed from one week to ten days to recover and for the swelling and oedema to subside. After this a closed zig-zag lengthening of the tendo Achillis is performed to prevent the pull of this muscle displacing the fragments following reduction. A Böhler's os calcis clamp is used to crush back the compressed bone to its former width as measured on the opposite heel. The heel is pulled down by the hand, and the arch of the foot is maintained by inverting the foot and everting the fore-foot while the plaster is applied.

Forrester gives an analysis of 150 cases in which he claims to have reduced the temporary disability from sixteen months to four and a half months, and the average ultimate specific loss from 60-80 per cent to 18 per cent.

**Fractures of the Carpal Scaphoid.**—If not diagnosed and treated energetically from an early date, these fractures present an important economic problem. The patients, though they have good functional range of movement, are unable to perform hard manual labour—in fact, hard work is impossible, on account of the pain in the wrist. When the surgeon is presented with such a case a year after the fracture, he is faced with a great problem in the treatment of it. Excision of the scaphoid gives a very unsatisfactory result, as few who lose this bone are relieved of the pain, and they complain of great loss of power in the wrist.

**TYPES.**—There are three types met with, and it is important to determine which one exists, as the prognosis and treatment vary with each type: (1) A fracture through the middle of the body of the scaphoid, which is intracapsular. (2) An evulsion of the tuberosity; this is an extracapsular lesion, and will heal with no difficulty in from four to eight weeks. (3) A comminution of the body of the scaphoid. This type is rare.

**DIAGNOSIS.**—Early diagnosis is of paramount importance, as delay in starting treatment is one of the most common causes of non-union. Most of the cases complain of a sprained wrist following a fall on the outstretched hand. On examination there is pain over the anatomical snuff-box, and on percussion of the tip of the outstretched thumb. X-rays should always be taken in extreme ulnar deviation.

**TREATMENT.**—

**Recent Cases.**—Opinion is divided as to the best position in which to immobilize the wrist. It is essential first to discover if there is any displacement of the proximal fragment. If there is, it must be replaced by flexion of the wrist in adduction, when the pressure over the proximal fragment will press it into position.

R. Soto-Hall and K. O. Haldeman,<sup>4</sup> of San Francisco, recommend that the wrist should be put up in a plaster cast, in a position of slight dorsiflexion (40°)

and in radial abduction. They point out that the thumb should also be included in a position of abduction, and further state that the plaster should come down to below the metacarpo-phalangeal joints. We question whether this is necessary, as it causes a too complete immobilization and leads to disuse atrophy.

*The Late Case.*—In late cases the ends of the fractured bone must be refreshed, and the two fragments drilled to establish a new blood-supply. After the drilling the patient should be treated as a recent case.

Gordon Murray,<sup>5</sup> of Toronto, suggests that a small tibial graft should be used to unite the two fragments (*Plate XXV*).

REFERENCES.—<sup>1</sup>*Brit. Med. Jour.* 1935, i, April 20, 813; <sup>2</sup>*Brit. Jour. Surg.* 1934, xxii, Oct., 246; <sup>3</sup>*Amer. Jour. Surg.* 1934, xxv, Sept., 404; <sup>4</sup>*Jour. Bone and Joint Surg.* 1934, xvi, Oct., 822; <sup>5</sup>*Brit. Jour. Surg.* 1934, xxii, July, 63.

### FRAGILITAS OSSIUM TARDA.

John Fraser, Ch.M., F.R.C.S.Ed.

Those who have made a study of congenital brittle bones recommend the recognition of four different types of disease in which undue liability of the bones to fracture forms an impressive and important part of the clinical history. They are: (1) The foetal type; (2) The infantile or honeycomb bone type; (3) *Fragilitas ossium tarda*; (4) Albers-Schönberg disease (marble bones). I. Fraser<sup>1</sup> deals with the third class, and records in a most interesting and impressive way the characteristic features of this important disease (*Plates XXVI-XXVIII*).

The principal points brought out are as follows. The disease is hereditary, being conveyed by either mother or father. It attacks both sexes with equal frequency and severity. The bone injuries rarely appear until after the age of 2 or 3 years, and their occurrence is infrequent after the age of 17 years, while five to twenty fractures have been recorded in single individuals during the period between these two ages. In addition to the bone error, two other features are generally encountered—blue sclerotics and deafness of the otosclerotic type. The blue scleræ are so constant that this feature should be regarded as the predominant hereditary factor. In some instances other errors have been noted, such as scoliosis, a tendency to sprain readily, and an early arcus senilis. It is generally accepted that underlying such a variety of disorders there is one common factor—a disturbance of the mesoblast which results in a structural deficiency of the fibrous tissue. The bones of the extremities present certain distinctive features. The shafts are slender, though they rarely bend; the cortex is thin, while the medulla is honeycombed. The extremities (epiphyses), in contrast with the shafts, present an expanded appearance, and the articular surfaces are often flattened and unduly approximated, so that the joint space may appear almost like a slit. These changes are the result of weight-bearing moulding the ends of the imperfectly ossified bones. The skull may assume an almost hydrocephalic outline, and this effect is probably due to the developing brain expanding the bones of an imperfectly ossified calvarium.

On two occasions an opportunity arose of examining the bones by biopsy, and in each instance the findings were similar. The bone texture revealed a surprising degree of hardness and density, "it cut like marble", and yet, according to Professor Young, who examined the tissue microscopically, "the general architecture of the bone shows no gross abnormality apart from some increase of density".

The origin of the condition is therefore undecided, and the obscurity is if anything increased by the fact that an examination of the blood chemistry has yielded negative results. The conception that the condition is primarily



PLATE XXVI

FRAGILITAS OSSIUM TARDA

(I. FRASER)



*Fig. A.*—*Case 16.* To illustrate the shape of the head and the tilt of the ears.  
On the right is a boy of the same age for comparison.

*Plates XXVI–XXVIII by kind permission of the 'British Journal of Surgery'*

# PLATE XXVII

## FRAGILITAS OSSIUM TARDA—continued

(L. FRASER)

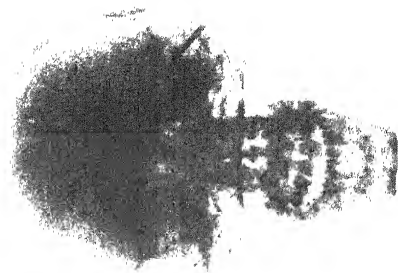
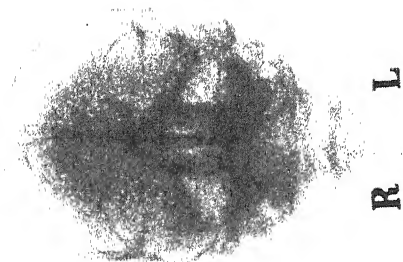
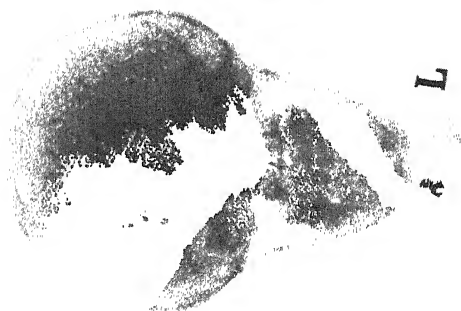


Fig. B.—

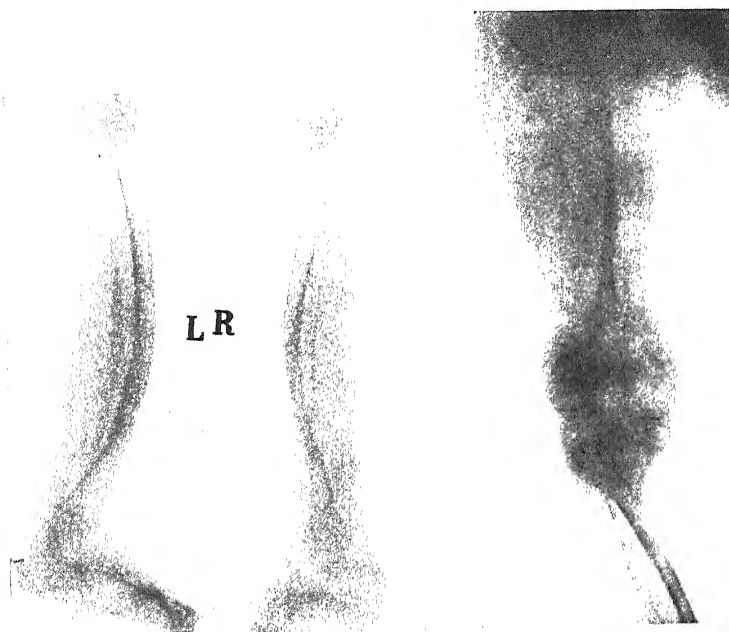
skull. Case 13 on the left, Case 16 on the right. In the centre is a control case for comparison.

— 86 —

# PLATE XXVIII

## FRAGILITAS OSSIUM TARDA—*continued*

(I. FRASER)



illustrate the decalcified  
of case of osteoporosis.

contrast with the soft parts.  
foetile type for comparison.



a mesoblastic one related to an inability of the connective tissue to deal with calcium may be correct, but much investigation is required before any precise idea of the various changes which ensue is gained.

REFERENCE.—<sup>1</sup>*Brit. Jour. Surg.* 1934, xxii, Oct., 231.

## GALL-BLADDER, SURGERY OF. *A. Rendle Short, M.D., F.R.C.S.*

B. Lipshutz,<sup>1</sup> of Philadelphia, argues in favour of operation without delay, except for necessary preparation, in acute cholecystitis usually with calculi. He admits that statistics show a higher mortality for such cases than for the interval operation, but dwells on the impossibility of deciding which case will happily clear up, and which will go on to peritonitis and other complications; cholecystectomy in the early acute stage is easy. [This is an oft-recurring problem which we have discussed over and over again in the MEDICAL ANNUAL.—A. R. S.]

M. Thorek,<sup>2,3</sup> of Chicago, calls attention to the drawbacks of ordinary cholecystectomy with drainage; the bed of the gall-bladder may ooze bile and cause biliary peritonitis, and the drain may give rise to hæmorrhage, cardiac embarrassment, acute dilatation of the stomach, hernia, fistula, etc. [We think this estimate greatly exaggerated, at any rate if a soft rubber dam drain is used, and it is quite sufficient unless the stump of the cystic duct leaks owing to faulty ligature.—A. R. S.] He therefore avoids the raw gall-bladder bed, and does away with the necessity for drainage, by electro-coagulation of the entire thickness of the gall-bladder wall. The gall-bladder is aspirated, the cystic duct exposed, tied, and divided, the free part of the gall-bladder removed with diathermy scissors to avoid bleeding, and the part of the gall-bladder adjacent to the liver is gone over with a button electro-cautery and destroyed. The edges are approximated with catgut sutures, and the falciform ligament is sewn over the area. No drains are used. He reports 118 consecutive cases without a death. [The method may be useful on occasion, but we have our doubts about the safety of dealing with the cystic artery in this way.—A. R. S.]

Professor O. B. Pribram,<sup>4</sup> of Berlin, recommends an oblique incision just above the costal margin, which he says cannot possibly give rise to an incisional hernia. When there is a stone lodged in the ampulla of Vater and the surgeon does not care to run the risk of getting it out by the retro-duodenal or trans-duodenal routes, it may be successfully dealt with by draining the common duct with the drain running downwards to the stones. Then, day by day, ether is injected, which is an efficient solvent (only 2 or 3 c.c. should be used). When by lipiodol and X rays it is demonstrated that the obstruction has been removed, the drain can be pushed on into the duodenum to dilate the ampulla, and later it is removed. Pribram had good success with this method in each of five cases.

Pribram has demonstrated spasm of the sphincter of Oddi, which may be painful, by injecting lipiodol into a tube in the common duct, and taking a skiagram. During spasm, not a drop passes into the duodenum; a milligramme of atropine is given intravenously, and the sphincter relaxes and bile is seen pouring through.

Discomfort after cholecystectomy may be due to too much spasm, or too free relaxation of the sphincter. An operation is desirable which avoids on one hand the upset of the nervous mechanism which follows removal of the gall-bladder, and on the other hand the well-known poor results of cholecystostomy. It is not to be found in cholecyst-gastrostomy, which sooner or later leads to infection. Pribram recommends anastomosing the gall-bladder to the common duct, after verifying that the ampulla of Vater is patent. He has

done this operation many times, with very happy results ; it is contra-indicated when the gall-bladder is thickened and inflamed or hydropic. The special indication is a condition of stasis (*Stauungsgallenblase*).

Von Haberer,<sup>5</sup> of Cologne, mentions that operations on the gall-bladder performed during acute attacks are much more likely to be followed by recurrence of symptoms than interval operations. He does not agree with Pribram that the operation of cholecystostomy ought always to be replaced by 'mucoclasia' (destruction of the mucosa with the cautery) ; it is a more severe operation for very sick patients, and in von Haberer's experience has sometimes been followed by attacks of cholangitis. Mere opening of the gall-bladder to pick out a stone, and closing again, is liable to allow of recurrence ; it is only to be resorted to for healthy non-infected gall-bladders, and particularly when stones are discovered in the course of some other operation. True recurrence, as opposed to false recurrence due to missed stones, is very rare after cholecystectomy, and in the majority of patients who are operated on a second time no stones are found, but cholangitis or stenosis. He greatly favours the T tube when the common duct is drained. It may be left in for months in grossly infected cases. Von Haberer does not think well of cholecystgastrostomy ; he prefers to anastomose the gall-bladder to the duodenum.

**Anastomosis between the Bile-duct and Duodenum.**—F. Bernhard,<sup>6</sup> of Giessen, finds that after this operation in about half the cases barium can be seen entering the biliary passages and distending them. After cholecyst-gastrostomy or cholecyst-duodenostomy this is rather less frequently seen. The patients in whom the barium enters are much more prone to attacks of pain and fever, evidently due to cholangitis, than those who remain free. The acidity of the gastric juice appears to be an important factor ; cholangitis symptoms are more frequent in the patients with achlorhydria. It is therefore worth while to give hydrochloric acid regularly for a long period. Cholecyst-duodenostomy, therefore, is an operation only to be performed when it is strictly necessary, as for stenosis of the common duct or of the ampulla of Vater complicated by disease of the gall-bladder.

**Time of Operation in Gall-bladder Cases.**—H. Finsterer,<sup>7</sup> of Vienna, is in favour of operation before complications arise. He believes that in any particular attack the policy of 'wait and see' is more dangerous than that of early intervention. In patients past sixty, gangrene comes on quickly and insidiously, and the proper time to operate is under twenty-four hours. He contrasts his own mortality, varying with the age from 0 to 9 per cent, with that admitted by Anschütz in cases of a similar type from 13.6 to 42 per cent. Anschütz waits for a quiet interval, but in a quarter of Finsterer's cases the gall-bladder was removed within twenty-four hours. He almost always does cholecystectomy. If diffuse peritonitis due to leaking gall-bladder was present, 60 per cent of his patients died. His mortality in 601 cases of gall-bladder surgery was 6.6 per cent. [This does not compare favourably with many British and American figures.—A. R. S.]

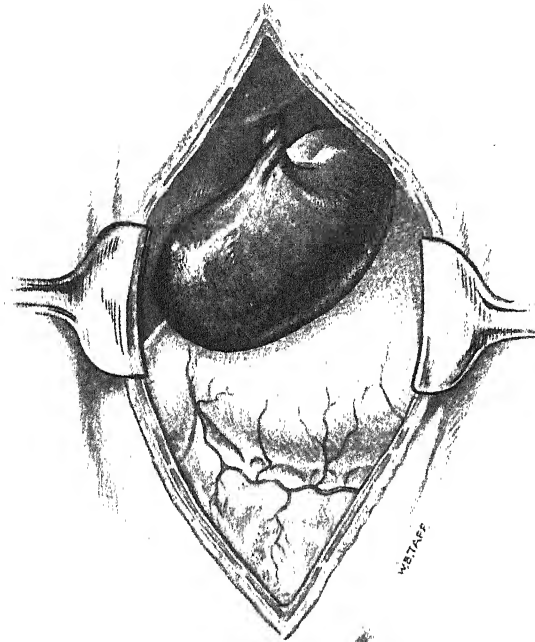
**Gall-stones in Africans.**—Gall-stones are relatively infrequent in members of the Bantu nations. At Johannesburg, out of 1673 European post-mortems there were 123 cases of gall-stones in females and 111 in males ; out of 1923 Bantu post-mortems there were 17 in females and 31 (mostly pigment stones) in males (I. W. Brebner<sup>8</sup>).

**Cholecystitis without Stones.**—W. A. Mackey<sup>9</sup>, of Glasgow, presents a study of 264 such cases treated by removal of the gall-bladder in Graham's Clinic, St. Louis, over ten years, 1922–31. In accordance with general experience, he found that the end-results were not nearly as good as in gall-stone

*PLATE XXIX*

TORSION OF THE GALL-BLADDER

(A. RENDLE SHORT AND R. G. PAUL)



Condition of the gall-bladder found at operation, black, and twisted on its pedicle.

*By kind permission of the 'British Journal of Surgery'*

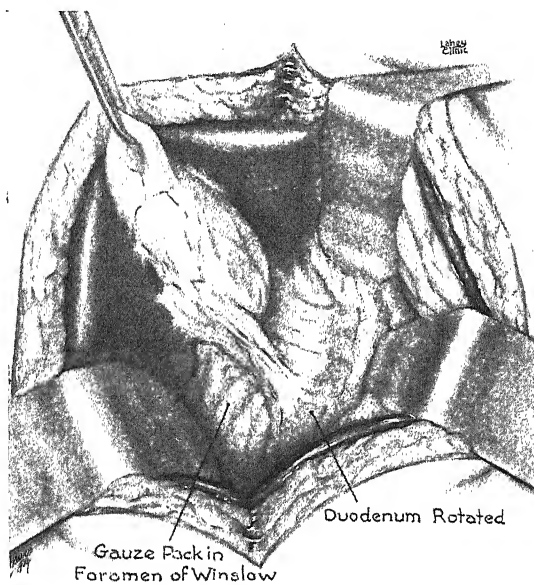




## PLATE XXX

### COMMON-DUCT EXPLORATION IN GALL-STONE SURGERY

(H. M. CLUTE AND N. W. SWINTON)



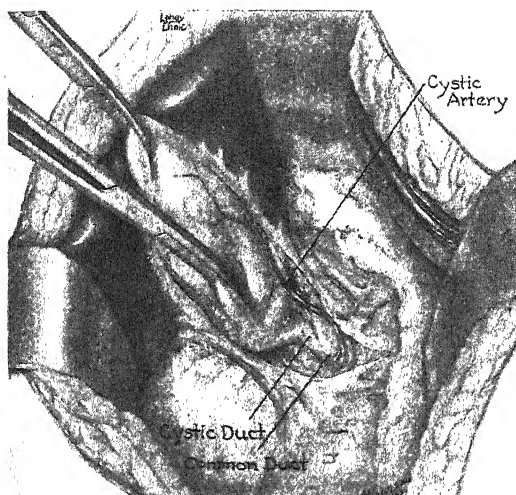
*Fig. A.*—Exposure of the gall-bladder and the common-duct area. Note the walling off of Morison's pouch by gauze packing. Note the Deaver retractor laid over gauze which is rotating the second portion of the duodenum downward and toward the mid-line, thus bringing out the region of the common duct.

PLATE XXXI by kind permission of  
"Surge, Gynecology and Obstetrics"

PLATE XXXI

COMMON-DUCT EXPLORATION IN GALL-STONE  
SURGERY—continued

(H. M. CLUTE AND N. W. SWINTON)



*Fig. B.*—With traction on the gall-bladder, incisions are made in the peritoneal coat starting over the common duct and running up each side of the gall-bladder. The cystic artery can be seen restricting complete extension of the cystic duct. The common duct and common hepatic duct are coming into view.

cases. The patients who have had real pain do better than those without real pain; thus of 47 with a history of biliary colic 76 per cent were well or improved, but only 58 per cent out of 93 without biliary colic. That is to say, in 37 per cent of the total the result is unsatisfactory. Neither symptoms, nor the cholecystogram, nor examination of the excised gall-bladder, give much information as to which patients will be cured and which will not. To warrant operation, there ought to be a typical history with real pain, and cholecystographic changes should be definite. Cholesterosis of the gall-bladder does not appear to be a pathological condition, and removal may not relieve the patient's symptoms. Probably in the patients who are unrelieved by cholecystectomy the source of trouble lay outside the gall-bladder, and removal of the appendix does not seem to help. An attractive explanation is offered by the theory advanced by Westphal in 1923, that there are three motor elements in the biliary tract—the muscular wall of the gall-bladder, the sphincter at the gall-bladder neck, and the sphincter of Oddi at the lower end of the common duct, and that pain may be due to nervous inco-ordination between these even when the gall-bladder is normal. But according to Halpert, in many human subjects there is no sphincter of Oddi.

**Torsion of the Gall-bladder (Plate XXIX).**—A. Rendle Short and R. G. Paul<sup>10</sup> relate three personal cases and present a study of fifty others from the literature. A pre-operative diagnosis could usually be made, the grounds being the occurrence of acute pain and vomiting, especially in an elderly female, with a palpable tumour having the general characteristics of an enlarged gall-bladder, *which comes up in a few hours, and may appear and disappear*. In some cases the swelling is masked by tenderness and rigidity. Early cholecystectomy usually saves the patient, even in octogenarians, and the operation is particularly easy.

**Anæsthesia in Gall-bladder Surgery.**—A paper from Buenos Aires, by A. J. Bengolea and C. V. Suarez,<sup>11</sup> deals with this subject. By blood examinations, and by excising a piece of liver for chemical and microscopical examinations, they show that during an operation on the bile-passages under ether anæsthesia there is a marked diminution in the glycogen content of the muscles, and more in that of the liver, and an increase of glucose in the blood. The liver cells become empty of glycogen. Under spinal anæsthesia with percain, the loss of liver glycogen was very small, though the muscles lost a good deal.

**Common-Duct Exploration.**—H. M. Clute and N. W. Swinton,<sup>12</sup> of the Lahey Clinic at Boston, mention that they explore the common duct much more frequently than they used to do. Between 1910 and 1926, of 619 gall-bladder cases, in only 15.5 per cent was the duct opened, and in 8.4 per cent stones were found in it; since then the duct is explored in about 40 per cent of the patients, and in 15 to 20 per cent stones are found. The older surgery would therefore have missed a good many. Especially if the gall-bladder is thick and contracted, or there are small stones in the cystic duct, or the head of the pancreas feels thickened, ought the duct to be explored, and in one-third of the cases in which stones are found there is not and never has been any jaundice. To open the duct comfortably, one needs good quiet anæsthesia and a long incision. The duodenum is rolled to the left with a Deaver retractor, and a gauze pack placed in the foramen of Winslow. After incision of the peritoneum over the common duct the junction with the cystic duct is exposed by gauze wiping, and the cystic artery tied to free the gall-bladder (Plates XXX, XXXI). The duct is opened longitudinally and a uterine probe passed through, if it will go, into the duodenum. If stones are present they are removed with forceps till the probe passes easily. Saline fluid is then injected through

a rubber catheter through the duct and ampulla into the duodenum, and a T-tube inserted. It is left in for ten to fourteen days. If a stone is lodged in the ampulla and cannot be brought up, the authors prefer retro-duodenal to trans-duodenal extraction, in spite of the trouble with bleeding points likely to be experienced.

A. W. Allen and R. H. Wallace,<sup>13</sup> also of Boston, use the dilators introduced by Bakes, of Czechoslovakia, the largest of which dilates the ampulla of Vater up to 14 mm. They add to the above indications for exploring the common duct those cases in which a second operation is necessary, or jaundice is present, or rigors have occurred, or no stones are found in the gall-bladder. They believe that dilatation in this last group prevents the recurrence of pain. They do not omit external drainage of the duct.

M. M. Zinninger and H. G. McCandless,<sup>14</sup> of Cincinnati, believe that when the common duct has to be drained it is better to insert the tube through the stump of the cystic duct.

**Mortality.**—The death-rate at Philadelphia has been reduced from 9.3 per cent (225 operations) in the 1922-8 period to 4.6 per cent (304 operations) in 1928-34. [My own mortality-rate over the whole period has been about 4 per cent, gradually falling.—A. R. S.] The improvement is attributed to better pre- and post-operative treatment, in particular to the use of intravenous glucose, transfusion, and feeding with bile through the Jutte tube (E. L. Eliason and W. Erb<sup>15</sup>).

**Causes of Failure.**—Two New York physicians, S. Eiss and J. H. Whaley,<sup>16</sup> believe that poor results after cholecystectomy are often due to the increased intestinal putrefaction, reduction of pancreatic secretion, and relative inability to digest fat which have sometimes been demonstrated. These changes they consider to be due to degeneration of the liver cells. Removal of the gall-bladder does nothing to help this, but leads to dilatation of the common duct and the ampulla of Vater, so that bacteria easily obtain access to the biliary passages. If cases were seen earlier, biliary drainage would be all that would be necessary. R. H. Miller and M. K. Bartlett<sup>17</sup> relate 15 cases in which a secondary operation was necessary for symptoms suggesting stones left in the common duct, and in 13 cases stones were found. Usually the duct had been explored at the primary operation but the stones were somehow missed.

**Cancer of the Gall-bladder.**—J. F. Erdmann,<sup>18</sup> of New York, states that as the incidence of cancer in gall-stone cases is in his experience (3000 cases) only 1.14 per cent, i.e., less than half his operation mortality, it is not fair, as some surgeons do, to secure consent from the patient for surgical treatment, by threatening him with the risk of on-coming cancer. There are no signs upon which a diagnosis of the supervention of malignancy can be based, unless metastases are already present.

**Cancer of the Ducts.**—R. Demel,<sup>19</sup> of Vienna, relates a case of successful resection for a growth at the junction of the cystic and common ducts, with end-to-end anastomosis over a tube. He finds records of 23 such operations in the literature, whereof 9 patients died.

REFERENCES.—<sup>1</sup>*Ann. of Surg.* 1935, March, 902; <sup>2</sup>*Jour. Amer. Med. Assoc.* 1934, July, 169; <sup>3</sup>*Arch. Phys. Therapy*, 1935, April, 207; <sup>4</sup>*Surg. Gynecol. and Obst.* 1935, Jan., 55; <sup>5</sup>*Zentralb. f. Chir.* 1934, Nov., 2616; <sup>6</sup>*Deut. Zeits. f. Chir.* 1934, Sept., 543; <sup>7</sup>*Wien. klin. Woch.* 1935, July, 911; <sup>8</sup>*Jour. Med. Assoc. S. Africa*, 1934, Dec., 867; <sup>9</sup>*Brit. Jour. Surg.* 1934, Oct., 274; <sup>10</sup>*Ibid.* 301; <sup>11</sup>*Bull. et Mém. Soc. nat. de Chir.* 1934, Dec., 1375; <sup>12</sup>*Surg. Gynecol. and Obst.* 1934, Dec., 906; <sup>13</sup>*Amer. Jour. Surg.* 1935, June, 533; <sup>14</sup>*Surg. Gynecol. and Obst.* 1934, Nov., 781; <sup>15</sup>*Ann. of Surg.* 1935, Jan., 460; <sup>16</sup>*Ibid.*, 1935, March, 921; <sup>17</sup>*New Eng. Jour. Med.* 1935, June, 1153; <sup>18</sup>*Ann. of Surg.* 1935, May, 1139; <sup>19</sup>*Arch. f. klin. Chir.* 1935, March, 148.

**GANGRENE.** (See also BLOOD-VESSELS, SURGERY OF; FRACTURES.)

**GANGRENE, DIABETIC.** (*See also* DIABETES.)*Sir W. I. de C. Wheeler, F.R.C.S.I.*

L. S. McKittrick and T. C. Pratt<sup>1</sup> discuss the question of amputation in this condition. Close co-operation between physician and surgeon is obviously necessary. A death from infection is one from ill advised treatment and failure to realize the dangerous possibilities of a gangrenous toe in a patient with diabetes mellitus. Every case of diabetic gangrene is actually or potentially infected. Not infrequently the removal of a septic gangrenous foot is better treatment for a coexistent severe cardiac lesion than morphia, digitalis, or any other medication.

**Pre-operative Surgical Preparations.**—McKittrick and Pratt urge the necessity for careful preparation. [In these articles over a number of years the MEDICAL ANNUAL has urged that pre-operative and post-operative care in all branches of surgery is more important than the actual operation.—W. I. de C. W.] The writers assume that the skin of all diabetics is infected by organisms, including those of gas gangrene. No 'scrubbing' is done in an area of lymphangitis. The skin is treated with alcohol and ether and painted with metaphen.

**Operative Technique.**—Spinal anaesthesia is used in almost every case. A tourniquet is not used. Flaps are avoided and are never used above the knee. A circular amputation ensures the best blood-supply and gives a satisfactory stump. The nerves are divided by an electric cautery. They are not crushed or ligatured. The fascia is sutured over the bone. All dead spaces are thus obliterated and the skin is approximated with a few loose interrupted sutures. Drainage is never employed. A guillotine amputation is usually performed below the knee. A tourniquet is employed. This amputation may be done through an area of lymphangitis or cellulitis. If the patient survives, amputation is performed at a higher level in two or three weeks' time. Guillotine amputations above the knee are unsatisfactory and are to be avoided. After a Gritti-Stokes amputation or a thigh amputation the patient is allowed to walk on a peg-leg during the third week. After amputation through the lower leg walking on a peg-leg is delayed until the fourth week. Twenty per cent of the patients on whom amputation was performed for diabetic gangrene have returned within two years for amputation of the remaining leg. A number of patients with cardiac lesions improved considerably after the amputation of the second leg, presumably owing to the enforced inactivity.

The writers of this useful and very practical paper come to the following conclusions:—

"Three hundred and ninety-six patients were operated upon for 497 separate lesions of the lower extremities during the eleven years ending Dec. 31, 1933, with a mortality of 11.4 per cent. Three hundred and twelve of these conditions were due to arterial deficiency, with a mortality of 14.1 per cent, whereas in 185 cases where the arterial supply was satisfactory, the mortality was only 7.2 per cent. The mortality following 326 major amputations is 15 per cent. Most of the successful toe amputations were on feet with good pulsation in the dorsalis pedis arteries, or with other evidence of good blood-supply. With 32, or 56 per cent, of the 57 deaths due to infection secondary to the local condition, the need for early and proper operation seems evident. Excluding the 32 deaths due to extensive infection on admission, which resulted in pre-operative septicæmia or extensive post-operative infection, a mortality of 5.3 per cent was obtained. This is suggested as the approximate mortality from unavoidable causes in this group of bad risk patients. The mortality following major amputations can approximate this only when cases are seen earlier, and the time for and type of operation to be done is accurately selected.

The mortality following toe amputations ought not to exceed this by more than a small margin. A mortality comparable to this 'basic' mortality is reported for the 73 cases operated upon in 1933 and for the 185 toe amputations reported during the past eleven years. Results following amputations at various levels are considered both from the immediate and late results. Amputations through the lower leg healed satisfactorily in properly selected cases. When this amputation has been done for gangrene, thrombosis in the popliteal or femoral arteries may follow and require amputation through the thigh at a later date. A lower leg stump adds greatly to the facility of using artificial limbs, but there is no justification for the increased risk and prolonged hospital stay following such an operation unless the general condition of the patient makes subsequent use of an artificial limb probable. A Gritti-Stokes amputation gives an excellent stump. It is particularly well adapted to one who must be on his feet for long periods of time. The operation is more hazardous than a supracondylar amputation and is followed by a somewhat longer hospital stay. The subsequent activities of diabetic patients, operated upon for gangrene, are sufficiently limited, so that a good supracondylar amputation will give a satisfactory functional result, and if done with a circular incision is the safest of all amputations. Painful stumps have not been experienced. Results following cauterization of the nerve and alcohol injection have been equally satisfactory.

Late mortality and morbidity in this group is frightful. Of 188 patients operated upon for gangrene two or more years ago, only 64 are still alive, and 22, or 34 per cent, of these have bilateral amputations. Bilateral amputation is frequently followed by relief from cardiac symptoms, and is compatible with a useful existence and a happy household, particularly if the patient is a woman. Except for a patient under 65 years of age, a bilateral amputation usually means a wheel-chair existence.

[A patient of mine, a man over seventy, with double supracondylar amputation for diabetic gangrene, walked about on two artificial limbs with the aid of crutches, followed his work as a master-builder, even going over half-finished buildings, and drove a car until the new Act enforcing insurance stopped him, because no company would insure him!—A. R. S., Ed.]

REFERENCE.—*Ann. of Surg.* 1934, c, Oct., 1638.

#### **GANGRENE OF THE SKIN, POST-OPERATIVE.** (See POST-OPERATIVE COMPLICATIONS.)

##### **GAS GANGRENE.**

*Sir W. I. de C. Wheeler, F.R.C.S.I.*

The incidence of gas gangrene in civil practice requires attention. The possibility of this infection is often forgotten until treatment is of no avail. The reviewer has seen wide infection of the abdominal wall with a fatal termination following the removal of the appendix. The *B. welchii* was isolated in this and a few similar cases. Attention has been called (MEDICAL ANNUAL, 1933, p. 184) to gas gangrene following hypodermic injection. Early recognition of the infection is essential. There is usually a wound causing considerable tissue destruction. After a period varying from a few hours to several days suspicion is aroused by a rise in temperature and pulse-rate, pain out of proportion to the local lesion, and a swollen tender ecchymotic area of a brownish hue is seen round the site of the wound. There is a pinkish foul discharge, and gas bubbles sometimes can be detected. In more advanced cases crepitations can be felt.

E. Eliot and E. R. Easton<sup>1</sup> give a review of 17 cases. They recommend the immediate administration of the *B. welchii* antitoxin when the organism is isolated. If more than one anaerobic organism is present, the polyvalent serum is indicated. Discussing amputation, these writers say that 8 cases in the

series recovered without amputation, but that removal of the limb is essential when the circulation is so impaired that the limb is no longer viable. Amputation is usually indicated when the period of incubation does not exceed twenty-four to forty-eight hours and when œdema and crepitations are spreading towards the trunk. In the absence of amputation multiple incisions with the excision of necrotic muscle must be carried out. The muscle tissue is the culture medium for the specific bacillus.

Compound fractures with laceration of the soft tissues are the type of injury followed by gas gangrene in civil practice. Instead of the guillotine amputation the reviewer suggests the 'sleeve' amputation in selected cases. Assuming there is a compound fracture near the middle of the thigh, instead of attempting amputation near the hip-joint a quick amputation is performed by the circular method through the knee-joint. The distal portion of the femur below the fracture is extracted by blunt dissection like a cork from a bottle. This leaves a long sleeve of soft tissues which are not sutured, and adequate drainage is provided. It is true that high division of the muscles is desirable in cases of gas gangrene, but high amputation of the thigh in these cases is a serious undertaking. It is better in selected cases to remove the leg by the form of amputation recommended and to place reliance on the very free drainage thus secured. A series of these cases was mentioned in the *MEDICAL ANNUAL*, 1925, p. 17. An illustrated description of the 'sleeve' amputation was given in the *MEDICAL ANNUAL* 1932, p. 22.

REFERENCE.—<sup>1</sup>*Ann. of Surg.* 1935, June, 1393.

#### **GAS POISONING IN WARFARE.** (*See* CHEMICAL WARFARE AND CIVILIANS.)

#### **GASTRIC.** (*See also* STOMACH.)

#### **GASTRIC ACIDITY.**

*H. Letheby Tidy, M.D., F.R.C.P.*

**Duodenal Regurgitation.**—N. F. MacLagan<sup>1</sup> (London) has prepared a statistical analysis of the results of fractional test-meals with the object of ascertaining evidence for or against duodenal regurgitation as a normal factor in gastric acidity. The special theories which he had in view are stated as:—

1. In the normal individual duodenal regurgitation occurs towards the end of the test-meal and is responsible for the fall of acidity which often takes place at this time.

2. Hyperacidity or the 'climbing curve' is usually due to interference with pyloric relaxation, resulting in failure of duodenal regurgitation and undue retention of the products of digestion.

The author accepts the presence of bile as the index of duodenal regurgitation and does not admit regurgitation in its absence and gives his reasons for this assumption. He also examines specially the emptying time and the volume of residue at two hours. On this system he examines the evidence of duodenal regurgitation in test-meals of various acidities and types, and forms the conclusion that there is no evidence of increased duodenal regurgitation in the high acidities and so-called peak curves. Therefore he rejects duodenal regurgitation as a cause of the normal fall of acidity. He believes that the fall and variations of acidity are due to secretion of an alkaline fluid by the pyloric mucous membrane.

[It will be observed that this survey only deals with the question of whether there is evidence of more duodenal regurgitation in high acidities than in the low ones, and does not exclude the possibility of important duodenal regurgitation occurring in all types. It also accepts bile as the standard index of regurgitation.

At the same time the survey directs further attention to the possibility of an alkaline secretion from the pyloric mucous membrane, a point which is now becoming of increasing importance.—H. L. T.]

**Normal Acidity in Histamine Test-meals.**—F. P. Lee Lander and N. F. MacLagan<sup>2</sup> have examined the gastric juice in 100 normal medical students after injection of histamine. They used a hypodermic injection of histamine 0.75 mgrm., closely agreeing with the usually accepted figure of 0.1 mgrm. per 10 kilo. The gastric juice was removed every ten minutes. The free acid is recorded as c.c. N/10 acid per cent. The maximum acidity and volume were usually found in the thirty or forty minutes period, but might occur at any time from ten to fifty minutes. The mean highest acidity was 110 c.c. with a standard deviation of 30. Among other points recorded it may be noted that there was only one case of achlorhydria, and only four cases gave an acidity below 55.

Three cases out of the 100 had shown achlorhydria with a gruel fractional test-meal on a previous occasion, but with histamine their output of acid was not much below the average. The mean volume of gastric juice was 200 c.c. per hour, with a standard deviation of 50. In 20 of the 100 students there was a history of dyspepsia in the parents. These students showed an acidity only slightly above the normal, but the volume of gastric juice was markedly increased, the mean being 230 c.c. per hour compared with 192 c.c. for the remaining 80 students. The author emphasizes that histamine may cause dangerous degrees of collapse in persons with low blood-pressure.

F. A. L. Mathewson<sup>3</sup> (Winnipeg) has tested a series of 20 cases giving achlorhydria with the ordinary Ewald's test-meal with histamine injections of 0.25 and 0.5 mgrm. He finds that the dosage 0.25 is too small, but that the dose 0.5 mgrm. was sufficient to test the presence of true achlorhydria.

REFERENCES.—<sup>1</sup>*Quart. Jour. Med.* 1934, xxvii, July, 321; <sup>2</sup>*Lancet*, 1934, Dec. 1, 1210; <sup>3</sup>*Canad. Med. Assoc. Jour.* 1935, xxxii, Jan., 59.

## GASTRIC AND DUODENAL ULCER. *H. Letheby Tidy, M.D., F.R.C.P.*

**Results of Medical and Surgical Treatment.**—E. S. Emery and R. T. Monroe<sup>1</sup> (Boston) have produced a careful and extensive study of peptic ulcer based on a survey of 1435 cases treated in the Peter Bent Brigham Hospital. Of these cases, 1167 were duodenal, 215 gastric, and 53 both gastric and duodenal. In this series 161 died, but only 87 (6 per cent) died from ulcer. Hemorrhage was the cause of death in 20, perforation in 28, obstruction in 4, and associated diseases and complications in 35.

**Table I.**—GENERAL SUMMARY OF THE RESULTS OF TREATMENT OF 1435 PATIENTS WITH PEPTIC ULCER.\*

	FINAL RESULTS ON ALL THE PATIENTS		RESULTS OF SURGICAL TREATMENTS		RESULTS OF MEDICAL TREATMENTS		RESULTS ON UNTREATED PATIENTS	
	No. of Patients	Per- centage	No. of Patients	Per- centage	No. of Patients	Per- centage	No. of Patients	Per- centage
No symptoms ..	221	17.5	91	19.0	149	13.7	30	23.8
Very few symptoms	411	32.6	93	19.3	397	36.5	11	8.7
Definite improvement	389	30.9	119	24.8	335	30.8	20	15.8
Improvement ..	65	5.1	39	8.1	69	6.3	5	3.9
No improvement ..	172	13.6	138	28.7	135	12.5	60	47.6
Totals ..	1258		480		1085		126	
No follow-up ..	177							

\* The final status of the 1258 patients that were followed is shown in the first column. In the other columns are grouped the results of the main classes of treatment.



The general summary of the results of treatment is shown in *Table I*. The untreated patients were those in whom the lesion was seen at autopsy or in life during the course of investigation for other conditions. Many patients had more than one operation or several different medical treatments, which accounts for an apparent discrepancy in the total numbers. A comparison of the results of medical and surgical treatment showed that operation gave a higher percentage of continuous relief, but the surgical failures were more than double the medical failures and the proportion of satisfactory results was distinctly lower.

*Table II.*—REASONS FOR FAILURE IN 1085 CASES OF MEDICAL TREATMENT AND 480 CASES OF SURGICAL TREATMENT.

	MEDICAL TREATMENT		SURGICAL TREATMENT		NO TREATMENT	
	No. of Patients	Percentage	No. of Patients	Percentage	No. of Patients	Percentage
Pain .. ..	386	35.5	197	41.0	52	41.4
Hæmorrhage .. ..	88	8.1	73	15.2	19	15.0
Obstruction .. ..	52	4.8	42	8.7	12	9.5
Hypersecretion .. ..	73	6.7	42	8.7	5	3.9
Perforation .. ..	12	1.1	8	1.7	24	19.1
Hour-glass contraction	7	0.6	7	1.4	4	3.1
Jejunal ulcer .. ..	0	—	47	9.7	0	—

The reason for failure of treatment is shown in *Table II*. The authors emphasize that surgical intervention in general was less successful than medical treatment in warding off pain, hæmorrhage, obstruction, perforation, and hour-glass contraction. Jejunal ulcers followed 11.3 per cent of gastro-enterostomies, 12 per cent of gastro-enterostomies with resection, 23 per cent of those with excision of the ulcer, and 16 per cent of those with transection of the pylorus.

*Table III.*—RESULTS OF 426 MEDICAL AND 90 SURGICAL TREATMENTS IN PATIENTS WITH PEPTIC ULCER WITHOUT COMPLICATIONS.

RESULTS	MEDICAL CASES		SURGICAL CASES	
	No. of Cases	Percentage	No. of Cases	Percentage
No symptoms .. ..	86	20.1	24	26.4
Very few symptoms ..	184	43.1	18	20.0
Definitely improved ..	112	26.3	22	24.4
Improved .. ..	15	3.5	10	11.1
Unimproved .. ..	29	6.8	16	17.7

The apparently unfavourable statistical results of surgical treatment is partly due to the inclusion of all cases of perforation and obstruction and cases with severe complications. In *Table III* are given the results of surgical and medical treatment in patients without complications, thus eliminating this factor.

In *Table IV* is given a survey of the results of individual types of treatment. It is noted that all the medical measures gave better results than the surgical.

The best results were obtained by complete or partial Sippy treatment. The authors are opposed to excision of the antrum on the grounds that it removes a part of the stomach which has an alkaline secretion, and they consider that these patients prove most refractory to subsequent medical treatment.

Table IV.—RESULTS OF 1563 THERAPEUTIC MEASURES IN 1258 PATIENTS WITH PEPTIC ULCER.

TYPE OF TREATMENT	NUMBER OF CASES	PER-CENTAGE WITH NO SYMPTOMS	PER-CENTAGE WITH VERY FEW SYMPTOMS	PER-CENTAGE DEFINITELY IMPROVED	PER-CENTAGE IMPROVED	PER-CENTAGE UNIMPROVED
Five meals, alkaline powders	938	13.1	36.7	30.3	6.4	13.3
Partial Sippy treatment ..	89	13.4	38.2	33.5	6.7	7.8
Complete Sippy treatment	58	25.0	31.0	34.4	5.1	5.1
Gastro-enterostomy .. ..	238	22.6	18.9	24.7	6.2	27.3
Gastro-enterostomy with excision of ulcer .. ..	34	23.5	20.6	23.5	11.8	20.6
Gastro-enterostomy with resection of stomach ..	58	13.8	24.1	15.5	5.1	41.3
Gastro-enterostomy with division of pylorus .. ..	31	16.1	12.9	29.3	3.2	38.7
Pyloroplasty (Finney) ..	43	20.9	23.3	25.5	11.7	18.6
Pyloroplasty (Heineke-Mikulicz) .. ..	11	9.0	18.1	36.3	9.0	27.2
Simple excision .. ..	56	8.9	17.8	28.5	16.2	28.5
Sleeve resection .. ..	9	11.1	11.1	33.3	11.1	33.3

In the treatment of uncomplicated peptic ulcer the authors adhere as closely as possible to Sippy's routine. Belladonna is regarded as occasionally valuable with patients with intestinal distress. Mucin has been discarded. A definite distinction is drawn between obstruction and retention, the latter being due to transient causes such as apprehension over the examination, or oedema about an ulcer, and yielding to treatment. The authors find that a certain number of patients who bleed frequently on medical treatment cease to bleed after operation, and therefore regard recurrent hæmorrhage as an indication for surgery.

The authors emphasize that the tendency to recurrences will always persist whatever may be the form of treatment adopted.

**The Histidine Treatment of Peptic Ulcer.**—This method has recently received considerable attention, and good results are recorded, but it would be premature to consider that it should supersede the more established methods.

E. Bulmer<sup>2</sup> (Birmingham) contributes a report of 52 cases treated by histidine injections. The report is of special interest as the cases were all treated in an out-patient department and as far as possible no other treatment was given. In all but one patient X-ray control was available, radiography being carried out before treatment, immediately after its termination, and at intervals subsequently. Treatment consisted of the daily intramuscular injection for three weeks of 5 c.c. of a 4 per cent solution of histidine. No local or general reactions were observed. The treatment began in February, 1934, and the results were recorded in December of that year. The immediate results of the histidine treatment were: (1) 58 per cent of symptomatic cures with disappearance of the abnormal radiographic findings; (2) 19 per cent of symptomatic cures with persistence of some radiological abnormality; (3) 23 per cent of failures.

**Hæmatemesis in Peptic Ulcer.**—The reviewer last year remarked that the subject of hæmatemesis had continued to attract a good deal of attention, and this has certainly not been less in the last twelve months. The question of hæmatemesis in peptic ulcer is becoming clarified as certain extraneous features are being cleared away. In the past it was customary to include in discussions on hæmatemesis all causes of bleeding from the stomach, such as cirrhosis of the liver and splenic anæmia. Further, the statistics of hæmatemesis

in peptic ulcer until the last two or three years have always included in one mass all degrees of severity from the most serious to the numerous trivial degrees of bleeding. In this way the mortality from hæmatemesis worked out at a very low figure and gave the general impression that hæmatemesis was not a serious matter in gastric and duodenal ulcers. This was the view taken as lately as 1924 in discussions at the Royal Society of Medicine on the treatment of severe gastric and duodenal hæmorrhage. Bulmer's statistics from Birmingham (*see* MEDICAL ANNUAL, 1929, p. 210) gave a mortality of 10 per cent in hæmatemesis in peptic ulcer, a figure which could no longer be regarded as negligible. Bulmer's later figures (*see* MEDICAL ANNUAL, 1934, p. 207) gave a similar result.

W. E. Chiesman (*see* MEDICAL ANNUAL, 1934, p. 207) found a mortality of 25 per cent for cases admitted to St. Thomas's Hospital specifically for hæmorrhage proved to be due to peptic ulcer. Chiesman's statistics were intended to ascertain the mortality in serious cases as opposed to trivial bleeding, a new aspect of hæmatemesis.

R. S. Aitken (*see* MEDICAL ANNUAL, 1935, p. 168) carried the differentiation a step further in a study of 255 cases admitted to the London Hospital. The mortality of all cases was 11 per cent, agreeing with the figures of Bulmer. But he separated a group of severe cases in which the mortality approached 1 in 3, while in the remaining cases it was almost negligible.

T. A. Lloyd Davies and R. W. Nevin<sup>3</sup> (London) have further emphasized the existence of a special group of severe grades of hæmatemesis. They analysed cases admitted to St. Thomas's Hospital during the years 1924-33 on account of significant hæmatemesis or gross melaena occurring within fourteen days before admission and also cases which developed significant hæmatemesis or gross melaena while in hospital. They divided these cases into two groups according to their condition on admission to hospital or immediately after the hæmorrhage as follows:—

*Group 1, Severe.*—Cases whose clinical condition would lead one to suppose that the hæmorrhage was severe or those in which the examination of the blood showed the hæmoglobin to be below 20 per cent.

*Group 2, Moderate.*—The cases whose clinical condition was not grave or in which the hæmoglobin was above 20 per cent.

This classification excludes numerous cases of trivial hæmatemesis. The total number of cases was 391; 153 fell into the severe group, and, of these, 69 died, giving a mortality of 45 per cent. Of the remaining 238 in the moderate group there were 15 deaths, giving a mortality of 6·3 per cent. These statistics show clearly that a group of severe cases exists in which the mortality is high, whilst outside this group the mortality falls to a low figure at once.

H. L. Tidy<sup>4</sup> also emphasized the existence and importance of this group. The group is not difficult to recognize clinically, although a satisfactory definition is not easy. With the recognition of such a group the question arises as to the best form of treatment, but at present there are no records which assist in a decision. It may be accepted that blood transfusion and even repeated or continuous blood transfusion is generally desirable. As to surgery, operation is only likely to be successful if the bleeding point can be found and dealt with. The operative risk is necessarily extremely high. The difficulty at present is that it is impossible to predict which cases will die and which will live, and further which cases will continue to bleed, a recurrence of hæmorrhage in an already exsanguinated patient being practically a death warrant. The question will no doubt receive further consideration in the future.

REFERENCES.—<sup>1</sup>*Arch. of Internal Med.* 1935, lv, Feb., 271; <sup>2</sup>*Lancet*, 1934, ii, Dec. 8, 1276; <sup>3</sup>*Brit. Med. Jour.* 1934, ii, Nov. 10, 858; <sup>4</sup>*Lancet*, 1934, ii, Dec. 15, 1365.

**GASTRIC AND DUODENAL ULCER, SURGERY OF.***A. Rendle Short, M.D., F.R.C.S.*

**Ulcer of the Greater Curvature.**—This is quite rare, but W. B. Hastings,<sup>1</sup> of Chicago, reports two cases. The X-ray appearance suggested carcinoma. Both patients did well after gastrectomy by the Polya technique.

**Gastrojejunostomy.**—R. W. McNealy and M. E. Lichtenstein<sup>2</sup> contribute a very interesting historical résumé of the evolution of this operation, beginning with Wolfier's successful case in Billroth's clinic in Vienna in 1881; Wolfier acted on the suggestion made by Nicoladoni, who was standing by. The next case, Billroth's, four days later, died of vicious-circle vomiting. The authors emphasize that the anastomosis should be on the posterior wall of the stomach running right down to the greater curvature, and that it should lie to the left of the vertebral column to avoid pressure between it and the abdominal wall.

A method of performing an anterior gastrojejunostomy by a no-loop technique is described by C. E. Rees,<sup>3</sup> of California. It may be useful when the posterior operation is impossible. The writer has apparently followed it only in one case. The anterior wall of the stomach is brought down through a rent in the gastrocolic omentum and transverse mesocolon to meet the jejunum.

**Pyloroplasty.**—At the Mayo Clinic, more than half their cases of duodenal ulcer are treated by excision of the ulcer and part of the pyloric sphincter, sewing up as a gastroduodenostomy. The end-results are favourable in 85 to 90 per cent of the patients (E. Starr Judd and J. R. Phillips<sup>4</sup>). This operation has a definite advantage over gastrojejunostomy, especially in young persons of a nervous temperament, in that it is never followed by jejunal ulceration. It is only feasible if the ulcer is accessible and the duodenum not too fixed. Another indication is in cases with recurrent hæmatemesis; a first bleeding should always be treated medically. One often finds, if operation is performed during the course of a hæmorrhage, that no actual ulcer is present, but merely a red thickened patch of duodenitis. A third indication for this variety of pyloroplasty is when duodenal ulcer treated by gastro-enterostomy is followed by jejunal ulcer: the gastro-enterostomy is undone, and the old duodenal ulcer together with part of the pyloric ring excised, provided of course that the duodenum is sufficiently mobile.

**Poor Results after Gastro-enterostomy.**—R. S. Allison, W. H. Patterson, and B. M. Maxwell,<sup>5</sup> of Belfast, relate five cases of achlorhydric anæmia following the operation. They all rapidly improved when treated with iron preparations.

Japanese experience of gastrojejunostomy is put on record in a paper by K. Ishihara,<sup>6</sup> of Tokio. His series is small, only 52 cases, of which 3 died. Of 30 followed up, only 8 were really satisfactory, and 17 either relapsed or suffered reduction of ability to work. This corresponds more with Central European than with British experience.

F. Rabboni,<sup>7</sup> reporting from N. Leotta's Clinic at Palermo, supports Leotta's thesis that peptic ulcer is only part of a right-sided abdominal syndrome in which appendicitis, the peritoneum, and the liver and pancreas usually play a part. It is not enough to deal with the ulcer; the appendix must be removed, and any adhesions divided, especially those about the ascending colon. If this is done, wedge-shaped excision and gastrojejunostomy are sufficient for gastric ulcers and local excision or gastrojejunostomy for duodenal ulcers.

**Partial Gastrectomy.**—W. H. Ogilvie,<sup>8</sup> believing that this operation is destined largely to replace gastrojejunostomy, writes of some improvements in the technique, aiming at lower mortality and the avoidance of post-operative vomiting, recurrent ulceration, and anæmia. General anæsthetics are too toxic, and high spinal anæsthesia too uncertain, but local infiltration of the abdominal wall, with splanchnic anæsthesia through the lesser omentum,



Fig. 22.—The blood-supply of the stomach and great omentum.

(Figs. 22-26 by kind permission of the 'British Medical Journal'.)

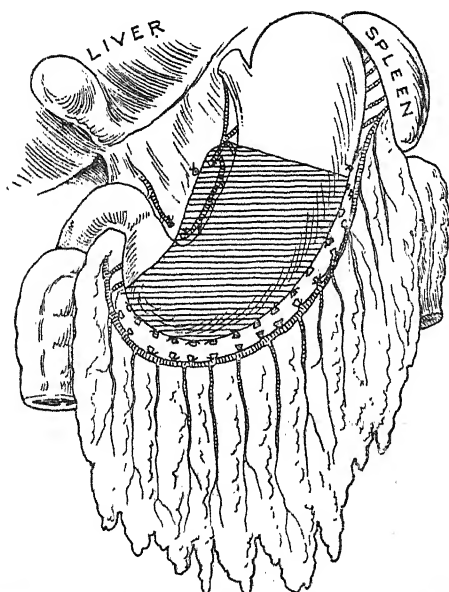
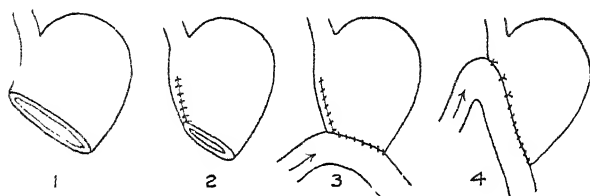
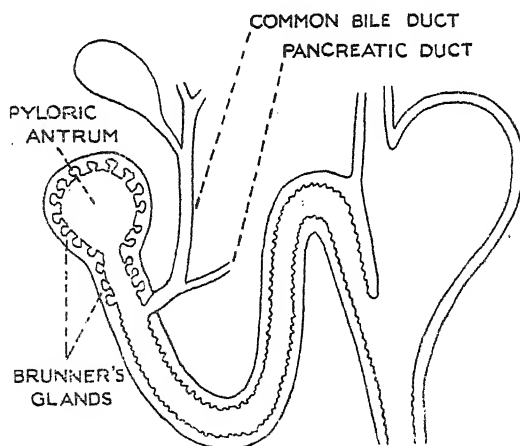


Fig. 23.—The parts to be removed in gastrectomy for ulcer.

preceded by  $\frac{1}{2}$  gr. of omopon one hour before operation, and  $\frac{1}{4}$  gr. of morphine with  $\frac{1}{100}$  gr. of atropine half an hour before, is entirely satisfactory. In a few cases gas-oxygen may need to be added. Shock is done away with, and time saved by the good relaxation and freedom from hæmorrhage. A median incision gives the best access. The great omentum must not be left deprived of its blood-supply (*Fig. 22*) by tying both ends of the gastro-epiploic arteries; it is better to remove it altogether by separating it off the transverse colon. When the operation is for gastric or duodenal ulcer, it is better to leave the pyloric antrum behind; this is easier to close than the duodenum, and makes it possible to leave the blood-supply of the omentum undisturbed. A duodenal



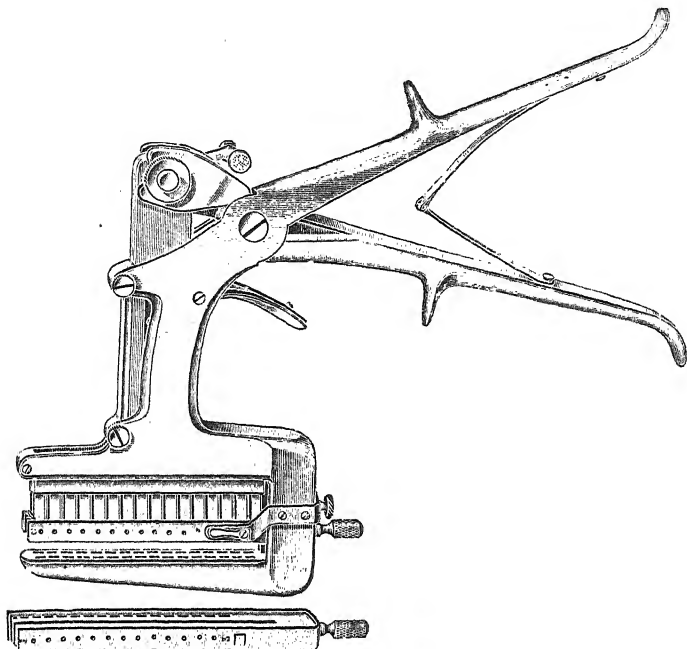
*Fig. 21.*—Construction of the stoma in the Finsterer non-return gastrectomy.



*Fig. 25.*—Diagram of gastrectomy for ulcer, to show maximum alkali conservation, and protection of the afferent loop against regurgitation.

ulcer, left behind, will heal well and safely. When operating for cancer, at least  $\frac{3}{4}$  in. of duodenum should be removed. To the left, the gastrectomy should go high, removing at least three-quarters of the stomach to get rid of the acid-producing glands (*Fig. 23*). The coronary artery ought to be ligatured and divided close to its origin from the celiac axis, to allow the stump of stomach to swing down without being tethered. The anastomosis should be of the posterior Polya type, but to avoid post-operative vomiting and, later, distension after meals, the Finsterer spur should be introduced (*Figs. 24, 25*). This is made by closing the upper part of the cut end of the stomach before attacking the jejunum. The proximal part of the jejunal loop is sewn to the closed end

of stomach; the distal part to the stoma. Ogilvie uses a Petz sewing clamp for the suturing (*Fig. 26*). Fluids administered during the operation are not necessary and make for post-operative shock; when the patient is back in bed they are better given by the mouth and by the rectum than in unnatural ways. H. M. Richter,<sup>9</sup> of Chicago, also speaks in favour of the Finsterer spur.



*Fig. 26.*—The Friedrich-Petz sewing clamp.

Instead of gastrojejunostomy or the Polya gastrectomy, F. G. Connell,<sup>10</sup> of Oshkosh, recommends partial fundusectomy, a large wedge being resected from the greater curvature. [The cases treated were few, and results not impressive.—A. R. S.]

*Results of Gastrectomy for Ulcer.*—M. Friedemann,<sup>11</sup> of Bochum, reports on the condition of 360 persons ten to seventeen years after operation in that Clinic:

Of 207 cases, Billroth I method	{	192 (92.8 per cent) good result
		15 (7.2) per cent) poor result
Of 153 cases, Billroth II method	{	144 (94.3 per cent) good result
		9 (5.7 per cent) poor result

**Duodenal Ulcer.**—E. L. Farquharson,<sup>12</sup> basing his conclusions on a follow-up of a series of cases treated medically and surgically at Edinburgh, regards the results as disappointing, especially in the patients giving a long history. Of the 200 medical cases, 15 per cent were cured and 45 per cent greatly improved. Of the 200 patients treated by gastrojejunostomy, 48 per cent were cured and 25 per cent greatly improved. The 'derelicts' were about equally divided between medical and surgical. Gastroduodenostomy gave a smaller proportion (28 per cent) of 'very good' results.

Angelo Chiasserini,<sup>13</sup> working first at Venice and later at Rome, makes use of gastroduodenal resection as his usual operative treatment for duodenal ulcer. He believes that if the death-rate can be reduced to reasonable proportions it gives much the best results in the long run. Spinal anaesthesia has been employed as a rule. The main difficulty is found in mobilizing the duodenum beyond the ulcer. Seven of his 75 cases died in hospital (9.4 per cent). The late results are not known, but he believes that they are good. [This publication is valuable as pioneer work in Italy, but the death-rate is, of course, far higher than after gastrojejunostomy, and it remains to be proved that the failures will be fewer.—A. R. S.]

Professor H. Finsterer,<sup>14</sup> of Vienna, returns to his advocacy of resection for exclusion (R. zur A.) for irremovable duodenal ulcer, stressing the importance of removing two-thirds of the stomach, and making the spur described above to prevent regurgitation of food into the duodenum. The pylorus may or may not be resected; if it is difficult it is left behind. His mortality is no higher than that for gastro-enterostomy. F. Hollenbach,<sup>15</sup> of Hamburg, writes to much the same effect.

**Hæmorrhage from Ulcer.**—Massive hæmorrhage from the duodenum is usually due either to a posterior ulcer or to duodenitis, according to J. J. Westermann,<sup>16</sup> of New York. Reporting on 50 such cases, he finds that repeated blood transfusions often fail to check the bleeding. He is in favour of immediate operation if the patient is not too ill; 26 of the patients were treated surgically, and often more than one operation was performed, for a recurrence at a later date. Some were treated by gastrojejunostomy, others by gastrectomy; returns of hæmorrhage invariably took place after the former, but not after the latter (the cases were few). Only 7 of the cases treated surgically died.

Another study, 87 cases, is presented by J. W. Hinton,<sup>17</sup> also of New York. If the bleeding takes place whilst the patient is on medical treatment, he advises operation as soon as the general condition warrants it. If an operation has already been performed either for ulcer or for hæmorrhage, it is useless to open the abdomen again. Of patients who bled without any warning in the way of previous pain or vomiting suggesting the pressure of an ulcer, at least half died, but if they recovered none of them bled again. They were treated medically. The most frequent cases are those which have had well-marked symptoms of ulcer but received no proper treatment for it. Some of them were treated surgically (17 cases, 4 deaths), and 21 medically; none of these had any further hæmorrhage. Operation is therefore not indicated unless they bleed again; probably they will not if they have adequate medical treatment.

French surgeons are very much interested in this problem, and Xavier Delore and F. Thiers,<sup>18</sup> of Lyons, present their experience. They begin by saying that the question of treatment "*passionné à juste titre les médecins et les chirurgiens*". They quote a successful case in which a posterior duodenal ulcer was the source of the bleeding; they tied the gastroduodenal artery first, and then performed a rapid gastropylorotomy. If one waits for medical treatment to be tried and perhaps fail, the patient will probably be *in extremis*, and the results deplorable. If the ulcer is on the lesser curvature, it ought to be resected by gastropylorotomy. For duodenal ulcer the choice lies between gastrojejunostomy, resection for exclusion, and gastroduodenectomy, the last being the most reliable.

**Perforated Ulcer.**—J. Calvet,<sup>19</sup> of Paris, comments on the grouping of cases into certain months of the year, and the heavy risks in the aged due to the relative quietness of onset of symptoms. The best treatment is the simplest,



merely closing the ulcer and leaving any further operation to a later date. Drainage is useless. Of 43 cases, 12 died.

H. Angerer,<sup>20</sup> of Innsbruck, speaks in favour of resection for perforated ulcer, and has had a death-rate of only 14 per cent in 92 cases. Older patients do badly.

**Gastrojejunal Ulcer.**—A collective inquiry by members of the British Association of Surgeons as to the frequency with which this complication follows gastrojejunostomy has been analysed by Garnett Wright.<sup>21</sup> The patients operated on by a large number of surgeons over a period of five years, or in another series ten years, were written to or interviewed. The analysis shows:—

Amongst 2051 traced cases of duodenal ulcer—	
There were 85 proved gastrojejunal ulcers	= 4.14 per cent.
There were 176 proved + suspected cases	= 8.63 per cent.
Amongst 1382 traced cases of gastric ulcer—	
There were 32 proved gastrojejunal ulcers	= 2.32 per cent.
There were 62 proved + suspected cases	= 4.48 per cent.

No patient who had been operated on for carcinoma developed an ulcer. Partial gastrectomy for ulcer by the Polya method, 1107 cases, was only twice followed by proved gastrojejunal ulcer, to which must be added 4 more suspected. Amongst cases treated by the Billroth I gastrectomy the ulcer-rate was heavy, 10 suspected and 1 proved out of 149 traced. Garnett Wright expresses surprise that gastrojejunal ulcer followed posterior gastro-enterostomy more frequently (10.45 per cent) when performed for gastric ulcer than for duodenal (8.49 per cent), and believes that many pyloric ulcers were classed as gastric that were really duodenal. Anterior gastrojejunostomy for duodenal ulcer carried a slightly higher risk than posterior, and when combined with entero-anastomosis (25 cases traced, 7 had ulcers) was thoroughly dangerous. Gastro-enterostomy done at the same time that a perforation was closed was more liable to be followed by ulcer than when done deliberately.

The age, sex, and symptoms are analysed, but present nothing which departs from the text-book picture. Barium skiagraphy gave a positive finding in 184 cases, negative or doubtful in 95. The date of onset of symptoms was often late; in a quarter of the cases it was over three years. No special error in technique of the first operation can be separated out for blame. Hyperchlorhydria was by no means always demonstrated; in a few cases there was low normal acidity or even achlorhydria. In 51 cases the gastrojejunal ulcer perforated acutely; in 40 there was a gastro-jejuno-colic fistula, and in 21 a leak into the mesocolon.

Turning to an analysis of treatment of proved cases, it is found that local excision usually failed to give relief. Undoing the anastomosis, with or without some form of pyloroplasty, carried a death-rate above 10 per cent, and only 20 per cent were cured. Nor was making a new gastro-enterostomy either safe or satisfactory. Gastrectomy by the anterior or posterior Polya method carried a mortality of 15 (anterior) to 20 (posterior) per cent, but it offers a 60 per cent chance of a cure, the posterior Polya cases doing rather better. Garnett Wright says that the table of results of operation for gastrojejunal ulcer "is a truly saddening experience, and one which reveals the complication as a black spot in surgery". No fewer than 76 (16 per cent of 456 cases) required yet another operation, and 85 died from the operation, or later. Of the 76 mentioned, 18 died of the further operation, and 10 were unrelieved, but 30 obtained at last a good result. There were 40 cases of gastro-jejuno-colic fistula. Of these, 14 died sooner or later after operation; 11 eventually got a good result, the best treatment being separation of the

fistula and restoration of a normal alimentary canal. A temporary double-ended colostomy may reduce this big surgical procedure to simpler dimensions. [It seems ungracious to question the value of so laborious and painstaking an inquiry, but I believe the incidence of gastrojejunal ulcer, as shown in this report, is misleadingly high. British surgeons who specialize in gastric surgery, and have always followed up their patients systematically, agree to quote figures about 2 to 4 per cent, and my own are not higher. The Association of Surgeons' Report suffers from a large proportion of untraced cases; of patients with duodenal ulcer treated by gastro-enterostomy, only 1730 out of 2734 were followed up. Experience suggests that, whatever the ailment, the unsatisfactory cases come back to us, at any rate in the provinces; the satisfied patients often disappear from sight after a few years.—A. R. S.]

A. J. Walton<sup>22</sup> says that the Follow-up Department of the London Hospital, which was started in 1919, can scarcely have missed any gastrojejunal ulcers that occurred, and after 1859 gastric operations performed by himself, *all of them traced*, only 31 got a secondary ulcer (1.6 per cent). These go back to 1913. Unabsorbable suture-material may have a slight influence in determining the formation of an ulcer; the use of clamps has more. Accurate apposition is probably a significant factor. Clinically, there are two definite types of symptoms, those that start with pain, and those that start with hæmorrhage. If surgical treatment is required, and as a rule it is, local excision is futile. Of undoing the anastomosis Walton has no experience. Partial gastrectomy was performed for 61 cases, of whom 16 died, but of the survivors only one had a recurrence.

D. C. Balfour,<sup>23</sup> of the Mayo Clinic, maintains that disconnection of the anastomosis will always cure the jejunal ulcer. The ulcer may be so small and soft that it cannot be palpated; if hæmorrhage has followed gastrojejunostomy, the anastomosis should be undone even if nothing can be felt. But there remains the problem of the primary condition, usually a duodenal ulcer, and if that is still present, a gastric resection is necessary, with or without resection of the first part of the duodenum, finishing by the Billroth I or Billroth II method of suturing. If the duodenal ulcer is accessible, and the duodenum mobile enough, it may be resected locally along with part of the pyloric sphincter. The most difficult cases of all are those where jejunal ulcer follows one or more resection operations; the best procedure then is to avoid the jejunum altogether, and join the stomach to the first or second part of the duodenum.

J. W. Hinton and R. E. Church,<sup>24</sup> of New York, put the percentage of jejunal ulcer after gastro-enterostomy as high as 16.4 (13 ulcers after 79 operations), and believe that many are missed because not followed long enough. At least a ten-year follow-up is necessary, and the patient must be seen and X-rayed at frequent intervals. Jejunal ulcers, like peptic, show the phenomenon called 'periodicity'—alternations of well and ill. The milder cases do well on medical treatment.

R. R. Graham and F. I. Lewis,<sup>25</sup> of Toronto, write to much the same effect about the higher incidence in the longer follow-up.

REFERENCES.—<sup>1</sup>*Ann. of Surg.* 1935, March, 844; <sup>2</sup>*Surg. Gynecol and Obst.* 1935, May, 1003; <sup>3</sup>*Ibid.* June, 1125; <sup>4</sup>*Ann. of Surg.* 1934, July, 196; <sup>5</sup>*Ulster Med. Jour.* 1934, Jan., 53; <sup>6</sup>*Arch. f. klin. Chir.* 1935, April, 664; <sup>7</sup>*Zentralb. f. Chir.* 1935, June, 1518; <sup>8</sup>*Brit. Med. Jour.* 1935, March, 457; <sup>9</sup>*Surg. Gynecol and Obst.* 1934, Sept., 337; <sup>10</sup>*Ibid.* Nov., 786; <sup>11</sup>*Zentralb. f. Chir.* 1935, June, 1456; <sup>12</sup>*Brit. Med. Jour.* 1935, Jan., 144; <sup>13</sup>*Ann. of Surg.* 1934, July, 172; <sup>14</sup>*Zentralb. f. Chir.* 1934, July, 1634; <sup>15</sup>*Ibid.* 1935, June, 1509; <sup>16</sup>*Ann. of Surg.* 1935, June, 1377; <sup>17</sup>*Ibid.* March, 856; <sup>18</sup>*Presse méd.* 1935, Feb., 203; <sup>19</sup>*Ibid.* Jan., 22; <sup>20</sup>*Arch. f. klin. Chir.* 1935, Feb., 578; <sup>21</sup>*Brit. Jour. Surg.* 1935, Jan., 433; <sup>22</sup>*Ibid.* 1934, July, 33; <sup>23</sup>*Amer. Jour. Surg.* 1935, May, 439; <sup>24</sup>*Surg. Gynecol. and Obst.* 1935, Jan., 65; <sup>25</sup>*Jour. Amer. Med. Assoc.* 1935, Feb., 386.

**GASTRITIS.***H. Letheby Tidy, M.D., F.R.C.P.*

The importance of the condition of the mucous membrane of the stomach has been brought to the fore in the last few years. Interest in its condition was greatly stimulated by the discovery of the etiology of pernicious anæmia and the primary part played by the stomach, and the question of the relationship of gastritis to ulcer and carcinoma has also obtained great prominence in recent years.

Knud Faber has always upheld its importance and has made valuable contributions to our knowledge of the pathology of the condition. More recently the question has been brought to the front by the observations of Konjetzny on parts of stomachs removed by operation for peptic ulcer. Konjetzny believes that gastritis precedes and is a necessary antecedent to the development of gastric ulcer. This view has also been accepted by Hurst. Efforts have recently been made to increase our knowledge of the condition of the mucous membrane of the stomach during life. The radiologists have attempted to do so by various so-called 'relief' methods in which small amounts of barium are used, the abdomen is compressed, and an outline of the rugæ stands out in relief.

*Gastroscopy* has now been made practicable by the introduction of the Wolf-Schindler flexible gastroscope. Various studies of the stomach and colon are now appearing. E. B. Benedict<sup>1</sup> (Boston) gives an account of the changes which may be observed with the gastroscope in chronic gastritis. The mucous membrane may be either hypertrophic or atrophic, but both types may occur in varying degrees in the same stomach. Classification according to these terms is not always possible. In the hypertrophic type the colour of the mucous membrane is a more intense red than normal. The rugæ tend to be large and tortuous with reddening of their surfaces, and glairy mucus may be prominent. A pseudo-polypoid appearance occasionally may be seen between the rugæ. In the atrophic form the normal folds are partially or completely flattened out so that the mucosa presents a smooth surface. When inflamed there is marked reddening and often thickening of the mucous membrane, but in advanced atrophy and pernicious anæmia the surface is pale and thin and the arterioles stand out very clearly. In the normal stomach and in hypertrophic gastritis, owing probably to the thickness of the mucosa, blood-vessels are not visible. Erosions may occur either with atrophic or hypertrophic changes. They are small surface defects in the mucous membrane which may or may not be actively bleeding at the time of observation.

REFERENCE.—<sup>1</sup>*New Eng. Jour. Med.* 1935, ccxii, March 14, 468.

**GLAUCOMA.***Sir Stewart Duke-Elder, M.D., F.R.C.S.*

While it certainly is the case that most cases of glaucoma will sooner or later require surgical intervention, and although more harm is done by delaying surgery than by operations improperly performed, the medical treatment of glaucoma is important and of more than usual interest, for there are certain conditions in which it is advisable to postpone surgery, or in which it may be avoided entirely. In chronic glaucoma the chief reason for this will be extreme age or infirmity of the patient; in acute glaucoma the lowering of the tension as a preliminary to operation reduces the risks of serious complications, gives time for arrangements to be made so that the operation can be done in the best circumstances, and makes the surgeon's work much more easy and more certain of a satisfactory result. A paper by S. R. Gifford,<sup>1</sup> of Chicago, on this question is of interest.

The author rightly considers that in *acute glaucoma* the line of conduct will depend upon how early the case is seen. If the condition has existed for

several days, operation can almost never be avoided, and should not be delayed longer than the few hours necessary for the proper preparation of the patient. Eserine, 1 per cent, should be instilled several times at intervals of a minute, and this may be repeated at half-hour intervals. The use of morphine is usually indicated for pain, and its miotic effect aids that of eserine. A saline purge may be of use by depleting the body fluids and so exercising an indirect osmotic effect on the intra-ocular fluids. These measures may reduce the intra-ocular tension to some degree, and a tonometric measurement of initial and subsequent tension is much better than the fingers in recording this. Such a reduction of tension is desirable to facilitate local anaesthesia and to reduce the chance of hæmorrhage following surgical decompression of the eye. Not more than a few hours should be lost in such procedures, however, in such a late case, and we must depend on the reduction of tension on the operating table by retrobulbar injections of novocain-adrenalin. If 4 min. of 1-1000 adrenalin are added to the syringe containing 1.5 c.c. of 4 per cent novocain, much more effect on tension will be obtained than if the novocain-adrenalin as usually prepared is employed. If one waits ten or fifteen minutes after such an injection, it is not uncommon to find the tension reduced 10 to 20 mm., or even to normal. In Gifford's hands the retrobulbar injection has replaced almost entirely the much more dangerous posterior sclerotomy which was formerly used as a preliminary to operation on eyes with very high tension. It is also the only means of assuring good local anaesthesia in acute glaucoma, where one formerly was often obliged to employ general anaesthesia.

In a case seen during the first twenty-four hours of the attack there will be more hope of reducing the tension to normal, so that operation can be done under more favourable conditions, or even avoided altogether. Here, in addition to the measures already described, there will be time for a form of osmotic therapy more efficacious than the saline purge. This is the intravenous injection of hypertonic solutions. Such solutions make the blood hypertonic and it rapidly extracts water from the tissues, including those of the eye: 35 to 50 c.c. of 30 per cent, or 100 to 150 c.c. of 10 per cent sodium chloride may be employed. Injections of sodium chloride must be given slowly and very carefully, since any solution injected outside the vein causes a slough. The use of 50 per cent glucose solution is more convenient, as it is apt to be on hand in hospitals for use in reducing intracranial pressure, and it has the additional advantage of not causing a slough when injected outside the vein, though it also must be injected with care: 100 to 250 c.c. of the 50 per cent solution must be injected, or 200 to 500 c.c. of the 30 per cent solution, according to the size of the patient. In common with other writers, Gifford has seen a number of remarkable drops in tension from the use of both sodium chloride and glucose. In one case of glaucoma following discission the tension fell from 60 Schiötz to 23 within six hours after the injection of salt solution, and was then kept normal by miotics.

There is one relatively minor procedure which may be successful in aborting an acute attack where operation is impossible or must be delayed too long for safety—namely, a simple paracentesis by a small limbar puncture. This may be done at home with no other equipment than a syringe of 2 per cent cocaine, a speculum, fixation forceps, and a small sharp cataract knife. It is of interest that Gifford, in common with most surgeons in this country, has entirely given up the use of amino-glucosan in these cases; while in this country most surgeons would add to the above expedients leeches applied to the temple—and find them very useful.

In *chronic simple glaucoma* a thorough trial of the usual miotics is nearly always given. Here 1 per cent pilocarpine or 0.25 per cent eserine is usually

efficacious in securing miosis ; there is seldom any reason for employing stronger miotics, whose unpleasant effects would become intolerable after a time. In a certain number of cases this effect may continue indefinitely. It is important to check progress in each case by frequently measuring the visual fields, however, and to remember that the tension varies during the day in glaucoma patients, so that one whose tension is always normal when seen may have higher tension at other times, especially during the night, which will cause gradual deterioration of the fields. Hence tensions should be taken at various times of the day, and especially early in the morning before any miotics have been used. The danger of miotics is of over-confidence in their effect, and a patient using them must be under constant surveillance.

There is one condition stressed by Gifford to which much attention has not yet been paid—œdema due to the binding of water in the tissues by sodium chloride. It is known that in many cases of glaucoma blood chemistry will reveal a slight relative alkalosis, with a slight decrease in blood chlorides. This means that chlorides as well as water are bound in the tissues in sodium. Elimination of sodium chloride from the diet, with the substitution of potassium chloride used freely as table salt, with a diet designed to leave an acid ash, will cause the œdematous tissues to give up their water in a manner which is sometimes most surprising. In some cases ammonium chloride is also given in doses of 6 grm. a day. There is another theoretical reason why a treatment designed to lessen alkalosis should reduce intra-ocular tension. This is the demonstrated fact that the vitreous humour shrinks in volume with very slight increases in acidity. An extreme result of this is seen in the ocular hypotony of patients in severe acidosis. This idea has been carried out by Gifford in a few cases of chronic glaucoma with tension hovering slightly above normal in spite of miotics. In two cases the effect was apparently quite definite, the tension dropping from 35 to 25 Schiötz, and being maintained so to date. In several others normal tension has been maintained, but other factors may have played a part in the result. The same idea of combating a faulty water metabolism was at the basis of reports from Germany on the effect of various diuretics such as novasurol and theobromine on ocular tension, but the practicability of their continued use in such a chronic condition may well be doubted.

When the use of miotics and the general measures mentioned above (which, it must be stated, are still in the experimental stage) fail to control tension and fields, one will usually advise operation. Under special conditions demanding delay, other measures become necessary. The most important agent at our disposal in such cases is *adrenalin* and its derivatives, either administered as adrenalin packs on cotton-wool in the upper fornix, or as amino-glaucozan. Adrenalin is contra-indicated in secondary glaucoma and whenever inflammation is present. Even in chronic simple glaucoma there is some danger that an acute rise of tension may occur following adrenalin. Apparently the mydriasis which occurs at first is the cause of this, converting the slight primary rise of tension which is normal into a marked one, but this may be obviated by the instillation of eserine.

*Secondary glaucoma* arises from such a large assortment of conditions that it is difficult to discuss it systematically. Treatment will in most cases depend upon the cause. In iritis with a secondary rise of tension one hesitates to use miotics, and here paracentesis, repeated after several days if necessary, will often keep the tension within safe limits until the inflammation is controlled by treatment directed against the cause and by large doses of *sodium salicylate*. Adrenalin is dangerous here, though a number of ophthalmologists have used it with good effect. A more useful drug is *ergotamine*, or 'gynergen'. This

is prepared from ergot, and besides causing contraction of the uterus, depresses the end-organs of the sympathetic nervous system. It is supposed to decrease the permeability of the capillaries and in this way its effect on intra-ocular tension may be explained. It is dispensed in ampoules, one-half an ampoule containing the usual dose for subcutaneous injection,  $\frac{1}{150}$  gr., which is usually repeated twice a day. Tablets of  $\frac{1}{150}$  to  $\frac{1}{30}$  gr. are also dispensed for oral use, two or three tablets three times a day being given, but the effect of oral administration has been by no means so definite as that of injection. By injections of ergotamine, Gifford has seen drops in tension from 30 to 18, 37 to 17, 35 to 20, and 40 to 25 mm. In chronic glaucoma it may be easily seen that a drug requiring two daily injections is impracticable, but in a few cases of glaucoma following cataract operation, and especially in one case of sympathetic ophthalmia, the effect of gynergen was most valuable, and in several cases a dangerous operation was avoided entirely. Unfortunately not all cases react alike to the drug, and in certain cases it proved absolutely ineffective. In glaucoma following cataract operation or discission, however, adrenalin may prove of great value.

When glaucoma after cataract operations resists miotics and the measures described, *cyclodialysis*, as pointed out by Elschnig, seems the operation of choice, as the filtering operations are here especially dangerous and apt to prove ineffective. Gifford regards this as the principal indication for cyclodialysis, and considers that for this indication alone one is obliged to master this simple but exceedingly delicate procedure.

To summarize briefly the non-surgical procedures in glaucoma, it may be stated that after the use of miotics the procedure of most value in acute glaucoma is intravenous injection of hypertonic solutions, in chronic glaucoma the use of the adrenalin group of drugs, and in secondary glaucoma, ergotamine. The effect of salt-free and acid-ash diet in chronic glaucoma is being studied with interest.

J. Gallois and P. Viard<sup>2</sup> have spent three years in the experimental use of a complex calcium-magnesium compound to alleviate chronic glaucoma. The formula consists of 0.8 grm. of magnesium hyposulphite and 0.7 grm. of calcium chloride in 10 c.c. of isotonic salt solution. The combination has been used previously as an antispasmodic in general disease. The drug is given, on the average, three times a week by slow intravenous injection. The use of miotics is continued in the usual manner. No appreciable modification of the iris and pupil follows the use of the drug. No modification occurs in the general arterial tension after one injection or after a series of injections.

After the injection the patient has a feeling of warmth; the face flushes, as also does the skin of the entire body; the disc becomes slightly hyperæmic, and perhaps the retinal veins dilate. The respiratory movements are accelerated. In the normal eye the intra-ocular tension is lowered some millimetres. In the glaucomatous eye there is usually an immediate lowering of tension, rarely an elevation, the average change being from 3 to 5 mm. and at times 10 mm. The lowering of tension continues for several weeks after the final injection. In hæmorrhagic glaucoma the injection gives a rise in tension, and the final results are mediocre. Thirteen cases are reported. There is a definite change in the hydrogen-ion concentration of the blood following the use of the drug to as low as 5.2; it is possible that this, by causing a diminution of the volume of the vitreous body, may play an important part in the mechanism of the drug.

REFERENCES.—<sup>1</sup>Canad. Med. Jour. 1935, xxxii, 287; <sup>2</sup>Bull. Soc. d'Ophthal. de Paris, 1934, June, 325.

**GOITRE.** (See THYROID.)

**GONORRHEA.***Col. L. W. Harrison, D.S.O.*

**Vaccine Therapy.**—R. E. Cumming and R. A. Burhans,<sup>1</sup> having tried a number of forms of vaccine therapy in gonorrhœa, report most favourably on the gonococcus filtrate of Corbus and Ferry (*see MEDICAL ANNUAL*, 1933, p. 196). [This product seems from its description to be closely similar to Compligon, a filtrate of gonococcal culture prepared by Schering-Kahlbaum and used with success both as a vaccine and as an antigen in the gonococcal complement-fixation test.—L. W. H.] Contrary to the advice of Corbus, the authors used the vaccine from the first onset of the disease. The dosage which they recommended finally ranged from 0.1 c.c. to 0.3 c.c., the injections being given intracutaneously into the thigh once a week. The reaction in most cases seems to have been only local, in the form of a zone of erythema varying in diameter from one to four inches around the site of the injection. The dosage appears to have been much smaller than that originally suggested by Corbus, which in an acute case started with 0.1 c.c. and increased by weekly increments to 1.0 c.c., while in an older case, say of four to five weeks' duration, it started with 0.75 c.c. The authors have also used the Corbus filtrate in doses of 0.1 to 0.4 c.c. as a provocative agent in latent cases under diagnostic examination or tests of cure. In some of their cases undergoing treatment with this vaccine they have seen the patient when apparently making good progress suddenly pass into a very acute phase, "with possible extension of the disease to the point, for instance, of fulminating adnexitis proving most recalcitrant to treatment." They attribute this phenomenon to their having supplied the patient with excessive antigen. [This corresponds closely with the early experience of P. A. Clements and J. Oliver with another gonococcal product (*see MEDICAL ANNUAL*, 1933, p. 196). The untoward effects then were attributed to an excess of toxin in the product, especially as C. White and H. G. Winter had found that intra-urethral injection of an autolysate of gonococci in an uncured but quiescent case of gonorrhœa frequently provoked a relapse that was most intractable (*see MEDICAL ANNUAL*, 1931, p. 225).—L. W. H.]

**Pyrotherapy.**—Heat as an agent for the treatment of gonorrhœa has attracted workers in this field probably ever since it was shown that the gonococcus succumbed to temperatures that could be tolerated by human tissues. The curative or inhibitory effect on gonorrhœa of intercurrent fevers has been known for at least forty years, and during the same period various workers have reported experiments which mostly placed the thermal death point of cultures of gonococci in the region of 41° or 42° C. when this temperature was maintained for some hours. With regard to the effect of heat applied directly to the genital passages, the reviewer in 1913 in collaboration with G. J. Houghton published a note<sup>2</sup> on treatment of gonorrhœa in the male with heated bougies, a method believed then by Kobelt to have some advantages over diathermy, which, however, completely superseded it at a later date.

The successful exploitation of artificially induced malaria by J. Wagner-Jauregg<sup>3</sup> (1918-19) for the treatment of G.P.I. has stimulated other workers to try it in the treatment of gonococcal infections, whilst others have used such pyrogenic agents as bacterial vaccines, milk, turpentine, and so forth, but with only partial success, and usually then only in chronic cases. The matter was put on a firmer basis by C. M. Carpenter and colleagues (*see MEDICAL ANNUAL*, 1935, p. 166), who showed in an elaborate experiment with fifteen strains of gonococci that exposure to a temperature of 41° C. for four hours or 41.5° to 42° C. for two hours would destroy 99 per cent of gonococci in culture. Acting on this and unpublished observations by Simpson (*see below*), A. U. Desjardins, L. J. Stuhler, and W. G. Popp,<sup>4</sup> between December, 1933, and September, 1934, treated 33 patients by the induction of hyperpyrexia to a temperature of between

41.1° and 41.7° C. (106° to 107° F.) maintained for six to eight hours according to the case. The fever was produced by placing the patient, all but his head, in an air-conditioned chamber called a 'Kettering hypertherm', an apparatus designed at Dayton, Ohio, by C. F. Kettering and Dr. W. M. Simpson, of the Miami Valley Hospital, Dayton. It is a horizontal box of which the base is a bed with an air mattress which can be rolled in or out of the cabinet at will. The chamber is sealed off from the outside air, but from a special chamber at its foot is pumped into it heated and humidified air the physical state of which is regulated by a thermostat and a humidistat. The air circulates through the chamber at the rate of ten times a minute. In the course of sixty to ninety minutes the patient's body temperature was raised to 41.1° C., and after a session it usually took about the same time to fall.

The scheme suggested by the authors as a result of their experience in these cases was to raise the patient's temperature to 41.1° C. and maintain it at between 41.1° and 41.7° C. for six hours on the first two sessions, and to employ the same procedure in the next two sessions unless by the end of the second the discharge still persisted, when the temperature should be maintained for seven or eight hours. The treatments were repeated every second or third day. The authors think that with this scheme of treatment more than four sessions should seldom be required to effect a cure. Naturally such hyperpyrexia requires unrelenting watch over the patient. Temperatures were taken by the rectum every ten or fifteen minutes until 40° C. was reached, after which they were taken every five minutes. To restore losses through perspiration, the patients were made to drink in each session from two to five litres of 0.6 per cent sodium chloride. Sedatives were given, especially to sensitive and nervous patients, the most satisfactory being codeine, nembutal, and sodium amylal. The results appear to have been far better than by any method of treatment previously employed. Of the 33 patients, 4 disappeared after the first sitting, leaving 29, of whom 25 are described as having been cured. The number of sessions required to bring about final cessation of discharge in the 25 were one in 9 cases, two in 4, three in 3, and from five to ten in 9. The reasons for failure to cure the remaining 4 cases were chiefly intolerance of the heat or imperfections in the apparatus. The times given here include those when the authors were feeling their way with the apparatus; as mentioned above, they expect that usually four treatments ought to suffice. Complications cleared up equally rapidly, and the possibilities of the treatment for the rapid cure of these and undrainable gonococcal foci in prostate and vesicles will appeal to all workers in this branch of medicine. In the discussions on fever therapy at the Fifth Annual Fever Conference held at Dayton, Ohio, in May, 1935, for abstracts of which the reviewer is indebted to Dr. Walter M. Simpson, Miami Valley Hospital, a number of speakers reported brilliant results of treatment by the method just reviewed in acute gonococcal arthritis and other manifestations of gonococcal infection.

W. Bierman and E. A. Horowitz<sup>5</sup> have obtained the most brilliant results in gonorrhœa of females by supplementing general hyperpyrexia with pelvic diathermy. In 37 out of 41 patients cervix and urethra were freed of gonococci by an average of 2.4 treatments per patient. In three others gonococci persisted only in the urethra and were exterminated by coagulation of Skene's tubules. Twenty-one of the cases had salpingitis, and five had arthritis, all of which cleared up rapidly. In discussion at the Dayton Fever Conference Horowitz said that the vaginal electrode employed in their work was shaped like a cast of the vagina; it contained a thermometer. Four indifferent electrodes were used, one abdominal, one dorsal, and two thigh. The maximum vaginal temperature permitted was 111° F. as it was found that a temperature of



113° F. maintained for three hours caused damage to the vaginal mucous membrane.

**Operative Treatment of Complications.**—The strong tendency is to treat the complications of gonorrhœa expectantly, resorting to operation only seldom. A. E. Goldstein, Baltimore,<sup>6</sup> reports on 241 acute and 358 chronic complications in which surgical treatment was employed whenever possible. In the acute complications it was usually found that early surgical intervention resulted in quicker recovery with less residual damage than when so-called conservative methods were employed. In epididymitis, opening the tunica vaginalis and puncturing the epididymis produced immediate relief from pain. In cases in which it seemed possible that there was pus in the epididymis, or the lumen might be obliterated, or there was a recurrent epididymitis, the author performed an epididymectomy unless the patient was unmarried or a young married man with less than two children. In the author's series acute epididymitis occurred in 143, or 264 per cent, of 540 cases of acute gonorrhœa, and in 32, or 6.9 per cent, of 460 cases of chronic gonorrhœa. Operation was performed on 44 of these cases (12 epididymotomy and 32 epididymectomy). Three of the 12 subsequently had a recurrence requiring epididymectomy. Of the 32 in which epididymectomy was performed, 28 showed definite occlusion of the lumen. In two prolonged cases of acute prostatitis the prostate was exposed through the perineum and punctured in several places. Rubber tissue drains were inserted for about a week and the condition subsided promptly. The author believes that this measure applied early would often prevent the development of prostatic abscess. A similar procedure in two cases of chronic prostatitis had no beneficial result. In prostatic abscess the author found that exposure through the perineum and evacuation of the pus by incision in several areas produced almost instant relief. In two cases of acute vesiculitis drainage through the perineum gave relief of discomfort, but drainage in chronic cases and injection through the vas seem to have given rather disappointing results. The author reports also on surgical intervention in phimosis and paraphimosis, in impermeable urethral stricture (by retrograde operation), in Cowperitis, and in urinary extravasation. In seven cases of sterility due to epididymitis an epididymovasostomy was performed, with only one success. Generally the author's report is a plea "for more and earlier surgery for the complications of gonorrhœa."

**Gonorrhœal Vulvo-vaginitis in Children.**—D. Nabarro and A. G. Signy<sup>7</sup> report on the treatment of 20 cases of gonococcal vulvo-vaginitis with *œstrin* on the principle that the gonococcus is not believed by most authorities to be capable of penetrating the adult vaginal mucous membrane, and *œstrin* when injected into immature animals has been found to provoke great proliferation of the vaginal epithelium resulting in an adult type of mucous membrane. Acting on this theory, R. M. Lewis<sup>8</sup> had used *œstrin* in 8 cases of juvenile vulvo-vaginitis, with great success. Nabarro and Signy, feeling their way with the dosage, found that injections of keto-hydroxy-*œstrin* (menformon) up to 750 units daily had no effect, but 3 cases responded well to 1000 units given daily for six weeks. Two children were negative in a week after a single intramuscular injection of 50,000 units of dihydroxy-*œstrin* (diformon), but both relapsed, though eventually they cleared up under further treatment of the same kind. The single massive dose was insufficient in the two other children on whom it was tried. The authors concluded that the best dosage by injection was 1000 to 2000 units daily. In 10 cases *œstrin* was given by mouth, and the daily dose recommended by the authors was 4000 units. They favoured the oral method of administration on account of its convenience, and proposed a scheme of dosage in which an initial injection of 10,000 units is

followed by a daily dose of 4000 units by mouth. The effect of the treatment in 'drying up' the discharge is described as dramatic. Side effects other than some enlargement of the breasts appear to have been practically absent. The treatment was supplemented by douching once daily, usually with "iodine" (? tr. iodi) 1-160. In two cases douching was withheld for a time, but the result showed the authors that this adjuvant was necessary, though they are convinced that douching alone will not cure a case of gonococcal vulvo-vaginitis. Relapses appear to have been rather common, but to have responded to further treatment by cestrin.

D. Kathleen Brown,<sup>9</sup> in an address before the Medical Society for the Study of Venereal Diseases, reported on 9 acute and 2 chronic cases of gonorrhœal vulvo-vaginitis in children treated with *astroform*, the daily dosage by injection being 200 to 900 units, and the total 5400 to 43,900 units. The only local treatment was swabbing the vulva with saline and powdering. Three cases responded well after 11,500, 13,000, and 19,200 units given in 19, 20, and 58 days. The results in the others appear to have been disappointing, and the author remarked that acute cases which did not respond readily to this form of treatment were infectious for a longer period than were cases under local antiseptic treatment. Brown's report on her experience with cestrin was only a portion of her general description of the treatment of vulvo-vaginitis at the Children's Home, Waddon, Surrey, a special establishment for the treatment of this disease in children whose treatment at home is impracticable. Amongst a number of points the following seem to be instructive. Vaginal irrigations are rarely given, but application to the vagina usually made with dressed probes. The lotions employed are various, e.g., 10 per cent protargol in glycerin; 5 per cent mercurochrome in water, or 25 per cent in glycerin; 1 per cent silver nitrate; 1-500 acriflavine. Careful attention is paid to the rectum, which is often infected (*see below*). The author's description of the methods of preventing cross-infection in this home should be studied by all who have the care of female children in wards or homes. As evidence of their success it may be mentioned that in the fifteen years the home has been in existence no child admitted only for congenital syphilis has ever contracted vulvo-vaginitis there, though they play with and sleep in the same dormitories as the other children. The secret of the success in prevention of cross-infection is recognition of the fact that, regardless of negative clinical and bacteriological evidence, the secretions of no child must come into contact with any other. The measures include the following: (1) Children have their own toilet articles and never touch any others; (2) Baths are swabbed down with lysol after each use, and no child is dried on the lap but standing in the bath; (3) No child is allowed on another's bed; (4) Temperatures are taken in the axilla, rarely in the mouth, and never in the rectum; (5) No child uses a w.c., but has her own chamber. Another measure which it may be well to keep in mind is to encourage children who are inclined to masturbate to have toys which have to be held with both hands on the pillow when going to sleep.

**Rectal Gonorrhœa.**—This appears to be a far more frequent accompaniment of gonorrhœa of the genito-urinary passages of women than is commonly believed. It is overlooked so much because in the vast majority of cases it gives rise to no symptoms and in most of the others they are very mild. Clement L. Martin,<sup>10</sup> in a short review of the literature on the subject preceding his own observations, mentions that in recent German literature there appears to be a general agreement that rectal infection is very common and very easily overlooked. He quotes L. Bickel and L. Abraham<sup>11</sup> as stating that "even after gonorrhœa of the genitalia has remained cured for more than ten years, gonococci may still be found in the rectum." Martin found that 30 per cent

of 111 women with gonorrhœa had gonorrhœal proctitis. His specimens were obtained by passing a Kelly female urethroscope and through it a cotton-tipped applicator. The diagnosis rested always on microscopical examination of smears, as Martin had no faith in cultural tests. Clinical signs were so slight and nondescript in most cases that they must be regarded as useless in diagnosis, but Martin says he would emphasize that "the presence of muco-pus in the last inch or two of the rectum is the most suggestive sign". The treatment was by instillation twice daily of 1 oz. of 5 per cent mild *silver protein*, which was introduced through an 18 or 20 F. soft rubber catheter.

The independent observations of P. A. Clements and K. E. A. Hughes<sup>12</sup> agree closely with those of Martin in respect of the high incidence of gonorrhœal proctitis in women with gonorrhœa, and in the comparative rareness and mildness of its symptoms. In 128 female cases with evidence, in slide and/or culture, of suffering or having suffered from gonorrhœa of the genito-urinary passages, 69 were found to have gonorrhœal proctitis, and in only 2 was there any complaint of local discomfort. In 8 of these cases at the time of the rectal examination the patients were under tests for cure, gonococci were not subsequently found in the secretions from the genito-urinary passages of any of these 8 patients, and they would have been passed as cured but for the findings in the rectum. In 7 other cases gonococci were never at any time found elsewhere than in the rectum; in 5 of these the gonococcal complement-fixation reaction was positive. The percentage of cases found to have gonorrhœal proctitis was higher than in Martin's series, probably because diagnosis was by culture as well as by smear. In 240 parallel tests both smear and culture were positive in 42 (17.5 per cent), in culture only in 28 (11.7 per cent), and in smear only in 11 (4.5 per cent). In treatment potassium permanganate proved disappointing, and the best results were obtained by douching with *acriflavine*, 1-5000. In 10 cases local treatment was withheld, but examinations repeated from one to seven months after first discovery of the infection proved negative in only one.

REFERENCES.—<sup>1</sup>*Jour. Amer. Med. Assoc.* 1935, civ, Jan. 19, 181; <sup>2</sup>*Jour. R.A.M.C.* 1913, xx, 135; <sup>3</sup>*Psychiat.-neur. Woch.* 1922, xx, 132, 251; <sup>4</sup>*Jour. Amer. Med. Assoc.* 1935, civ, March 16, 873; <sup>5</sup>*Ibid.* May 18, 1797; <sup>6</sup>*Ibid.* March 9, 800; <sup>7</sup>*Brit. Med. Jour.* 1935, i, March 16, 604; <sup>8</sup>*Amer. Jour. Obst. and Gynecol.* 1933, xxvi, 593 (ref. Nabarro & Signy); <sup>9</sup>*Brit. Jour. Ven. Dis.* 1935, xi, 207; <sup>10</sup>*Jour. Amer. Med. Assoc.* 1935, civ, Jan. 19, 192; <sup>11</sup>*Zentralb. f. Gynäkol.* 1932, lvi, Jan. 23, 200; <sup>12</sup>*Lancet*, 1935, ii, July 6, 18.

## GOUT.

A. H. Douthwaite, M.D., F.R.C.P.

The only important contribution to the recent literature on gout is provided by L. M. Lockie and R. S. Hubbard,<sup>1</sup> who have studied the effects of certain diets on purine metabolism. It has already been shown that the giving of high fat diets to the normal person results in a great rise of blood uric acid, which returns promptly to normal as soon as high carbohydrate or high protein diets are substituted. In gouty patients the same rise of blood uric acid occurs on high fat diets if given for a week or more. On the other hand, the blood uric acid falls very slowly in the gouty subject when subsequently fed on a high carbohydrate diet. A month may be required for a return to the pre-experimental level. There appears then to be a resemblance between this marked persistence of increased uric acid after high fat diets, and the delay in excreting uric acid after diets rich in purines or after injections of uric acid which gouty patients always show.

It is of great clinical interest to note that the authors found that the joint pains of gout became as a rule very much worse within three or four days of the commencement of a high fat diet, and they in no way paralleled a rise of blood uric acid.

REFERENCE.—<sup>1</sup>*Jour. Amer. Med. Assoc.* 1935, civ, June 8, 2072.

**GRANULOMA ANNULARE.** *A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.*

E. O. Halliwell and J. T. Ingram<sup>1</sup> have investigated 12 cases of granuloma annulare and have reviewed 261 cases already published. In 3 of the author's 12 cases lupus vulgaris was also present. They have compared the age incidence of granuloma annulare with that of lupus vulgaris, using 233 cases of the latter disease, and are struck with the parallelism shown by the age incidence curves in the two conditions. Assuming, as is generally supposed, that granuloma annulare is a blood-borne toxic manifestation, the authors think that the age incidence favours the view that the affection is due to tuberculous rather than other toxins. They have also obtained some support for their view by the association of certain cases of granuloma annulare with tuberculous manifestation, as in their cases with lupus vulgaris, and by family histories. They have not, however, obtained constant results with tuberculin reactions; in their 12 cases 7 only gave a positive Mantoux reaction. In Martenstein's series two-thirds only of the cases were positive. The authors point out some of the difficulties in the interpretation of tuberculin reactions and conclude that in the present state of our knowledge it is not necessary to accept a negative reaction as negating a tuberculous etiology.

REFERENCE.—<sup>1</sup>*Brit. Jour. Dermatol. and Syph.* 1935, xlvii, Aug.-Sept., 319.

**GRANULOMA INGUINALE.** *Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

A good illustrated description of this disease as seen in the Madras Presidency is recorded by V. G. Nair and N. G. Pandali.<sup>1</sup> In all their 73 cases the lesions were in the genital and contiguous areas, and 38 were in women, although males greatly predominate in their venereal clinic. The incubation period after exposure to infection averages eighteen days, and the initial papular lesions ulcerate, heal, and break down again, and then slowly spread in the form of a very superficial ulcer without suppuration or purulent discharge, but with a nearly dry surface exuding a thin watery fluid containing the diagnostic Donovan bodies. The ulcers may heal at one part and spread at another, and last for several years with an average of two and a half years. The glands are usually unaffected—an important point of distinction from climatic bubo or lymphogranuloma. *Tartar emetic* intravenously remains the most effective treatment, especially in early cases. These writers are somewhat doubtful regarding the venereal origin of the disease, for in 51 married patients in none was the partner infected. T. B. Menon and P. Natesan,<sup>2</sup> also with Madras experience, are positive that the infection of this disease is generally contracted venereally, and they describe and figure the primary papular and ulcerating stage on the prepuce, which appears three to four weeks after sexual intercourse, although extra-genital inoculations may occur as in other forms of venereal ulceration. R. V. Rajam<sup>3</sup> deals with the treatment of the disease and advocates intramuscular injections of *fouadin* in from 1.5-c.c. doses, increased daily up to 4.5 to 5 c.c., with a total of 40 c.c. or more.

REFERENCES.—<sup>1</sup>*Ind. Med. Gaz.* 1934, lxix, July, 361; <sup>2</sup>*Ibid.* 1935, lxx, Feb., 66; <sup>3</sup>*Ibid.* lxix, July, 372.

**GRAVES' DISEASE.** (*See THYROID SURGERY.*)**GYNÆCOLOGY, MENTAL ASPECTS OF.** (*See MENTAL ASPECTS OF GYNÆCOLOGY.*)**HÆMATEMESIS IN PEPTIC ULCER.** (*See GASTRIC AND DUODENAL ULCER.*)**HÆMATURIA.** (*See RENAL DISEASES.*)

**HÆMOCHROMATOSIS, SKIN PIGMENTATION IN.**

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

F. F. Hellier<sup>1</sup> has investigated the nature of the pigment found in the skin in cases of hæmochromatosis. He has made a study of 15 cases occurring among 12,000 autopsies at Leeds Infirmary. He finds that the colour of the skin in this disease is due to two pigments. The first, an iron-containing pigment, hæmosiderin, is present in the corium, chiefly in the neighbourhood of the sweat glands; it can at times be solely responsible for pigmentation of a bluish-black, slaty, or leaden colour, which is sometimes generalized, but is always more marked on the face, neck, exterior surfaces of the limbs, and usually the external genitalia. The second is an iron-free pigment, melanin, which is found in the deepest layers of the epidermis, and occasionally to a small degree in chromatophores in the corium, and which probably contributes a brownish tone to the other colours. In a number of cases this latter pigmentation has certain similarities to that found in Addison's disease, especially in its involving mucous membranes, and in producing localized spots of increased or decreased pigmentation. In all cases in which excess of melanin was deposited in the skin, and in which the suprarenals have been adequately examined, a heavy deposit of iron has been found in the suprarenal cortex, though the medulla remains free. The author suggests that there may be a causal relationship between these two findings. Against this is the fact that no association between the deposit of melanin and a fall in blood-pressure can be found, but the author points out that pigmentation in Addison's disease may precede the fall in blood-pressure by many years.

REFERENCE.—<sup>1</sup>*Brit. Jour. Dermatol. and Syph.* 1935, xlvii, Jan., 1.

**HÆMOPHILIA.** (See BLOOD DISEASES.)**HÆMORRHOIDS: INJECTION TREATMENT.**

J. P. Lockhart-Mummery, F.R.C.S.

Several papers have appeared on this subject, which has been recently treated in the MEDICAL ANNUAL (1933, p. 199). Most writers point out the importance of careful selection of cases suitable for the injection treatment. There appears to be a good deal of disagreement as regards the best solution. That most commonly used in England at the present time is a 5 per cent solution of *phenol in almond oil* with a small quantity of *menthol*. This is filtered and sterilized. In America, however, several authors have advocated the use of a 5 per cent *quinine urea hydrochloride* solution. From experience gained in this country it would appear that the quinine urea solution is not very safe, and a number of cases of severe abscess and fistula have resulted from its use, whereas no such complications appear to have occurred after the use of the carbolic solutions. This may be accounted for by the fact that quinine urea is a very irritating solution, but the more likely reason is that it is not so antiseptic as 5 per cent carbolic. At any rate, evidence appears to be strongly in favour of the fact that carbolic solutions are much safer to use than any of the others, and there can be no doubt about the satisfactory results obtained. The reviewer has seen three cases in the last twelve months of severe abscess resulting from the use of quinine urea.

Several authors describe symptoms following the injection. Slight pain is occasionally complained of, and is generally due either to too much of the solution having been injected at one time, or to its having been placed too near the anal opening, so as to involve the mucous membrane immediately within the sphincter. P. G. McEvedy<sup>1</sup> described 4 cases of incontinence out of 300 injections, but nobody else has described this symptom. Slight influenza-like

symptoms, with a slight rise of temperature, and pains in the joints have been described by several authors, which are almost certainly due to the patients' having an allergy to olive oil, and have nothing to do with the carbolic. In such instances a glycerin solution should be used instead of an oily one. In one or two instances liquid petroleum was used in place of oil, with the result that small cysts were formed, owing to the fact that the petroleum is not absorbable. Such solutions should on no account be used.

F. G. Balch<sup>2</sup> gives the results of 359 cases of piles treated by the injection method in the Massachusetts General Hospital: 91 per cent of the cases required five treatments, or less, to procure a good result. The number of cases requiring surgical treatment is very much diminished since the institution of the injection treatment. He comes to the conclusion that 85 to 90 per cent of cases of hæmorrhoids that come into the clinic can be treated by injection.

A. S. Morley<sup>3</sup> discusses the use of phenol injections in the treatment of rectal prolapse. The injections are made as high up as possible in the bowel, and the whole circumference is treated in a series of segments, either at one or several sittings. In cases of mild prolapse results are stated to be good, although in the author's experience they are not very permanent.

REFERENCES.—<sup>1</sup>*Lancet*, 1932, i, Jan. 2, 17; <sup>2</sup>*New Eng. Jour. Med.* 1935, cxii, Jan. 10 57; <sup>3</sup>*Brit. Med. Jour.* 1934, ii, Aug. 4, 204.

#### HAY FEVER. (See ASTHMA AND HAY FEVER.)

**HEART DISEASE.** (See also ANGINA PECTORIS; ARRHYTHMIA; CORONARY ARTERY DISEASE; ELECTROCARDIOGRAPHY; THYROID SURGERY; and other entries under HEART.) A. G. Gibson, M.D., F.R.C.P.

**Rheumatic Heart Disease.**—W. T. Ritchie<sup>1</sup> gives a review of rheumatic heart disease with its nature, course, and prevention based on a series of 244 cases. The age at onset is most common between 11 and 15 years and a small number are reported at the age of over 40. Nodules may be found in cases that are not obviously rheumatic and are occasionally not found in those that are. The nodules on the elbows, knuckles, and knees, though they often indicate a severe rheumatic affection, also occur in those cases which run a mild course. Though salicylate treatment lowers the temperature, relieves pain, and may lessen the arthritic swelling, these symptoms tend to subside spontaneously. The value of the report lies in the fact that it gives the conclusions of a large experience.

**Gall-bladder Disease and Heart Disease.**—On electrocardiographic grounds T. FitzHugh and C. C. Wolferth<sup>2</sup> find that the successful removal of gall-stones or the excision of an inflamed gall-bladder may have the effect of removing a cardiac abnormality which was present before the operation. Apart from the mimicry of cardiac by gall-bladder disease, they mention the growing conviction that gall-bladder disease may initiate or aggravate heart disease, especially coronary heart disease. They refer to the effect of cholecystectomy and other operations in occasionally restoring cardiac compensation from a condition of cardiac failure, or normal rhythm from paroxysmal auricular fibrillation or paroxysmal tachycardia, or, thirdly, in the marked amelioration in some cases of apparent angina pectoris. In a group of six cases they found that there were significant changes in the electrocardiogram before and after operation. Whereas the tracing suggested coronary disease before, afterwards there was no sign, though in some the changes were not completely shown. It is stated, however, that many patients with gall-bladder disease do not present any evidence of cardiac disease either clinical or electrocardiographic,

neither are all patients in whom gall-bladder disease and heart disease are combined benefited by gall-bladder surgery, and it is also true that a serious coronary occlusion may occur from an attack of cholecystitis. The paper suggests that there must be a close connection between the two conditions which is deserving of further study.

**Circulation Time in Heart Failure.**—W. M. Hitzig, F. H. King, and A. M. Fishberg,<sup>3</sup> in estimating the circulation time in failure of the left side of the heart, find that it is almost always prolonged, sometimes up to three times the normal. The method they use is to inject gluside into an antecubital vein and estimate the time until a sweet taste is perceived in the tongue. This is known as arm-to-tongue circulation time. The arm-to-lung circulation time has been measured by the Hitzig method of injecting 5 min. of ether in normal saline into the vein and measuring the time between this and the perception of ether vapour in the expired air of the subject. The normal arm-to-tongue circulation time is between 9 and 16 seconds, and the arm-to-lung circulation time is between 4 and 8 seconds. In cardiac failure the arm-to-tongue circulation time varies between 11.25 and 60.5 seconds. In a small series of cases in which both times were measured the arm-to-lung circulation might be normal in spite of failure of the left side of the heart and markedly prolonged arm-to-tongue circulation time. These facts point to a considerable slowing of the circulation through the lungs in cardiac failure of the left ventricle.

**Cardiac Output in Relation to Heart Failure.**—T. R. Harrison, B. Friedman, G. Clark, and H. Resnik<sup>4</sup> have studied the cardiac output in relation to cardiac failure. Cardiac failure has been looked upon in recent years as due to diminished output and the breathlessness that occurs as the result of a diminished blood-supply. The older clinicians were inclined to attribute it to back-pressure, or the piling up of blood in the lungs and venous system. The method adopted has been the acetylene method, which need not here be described, but the results show that in patients with congestive heart failure the cardiac output per minute is from 10 to 30 per cent less than in normal subjects, but may be within normal range. Patients also with circulatory diseases may have an equally low cardiac output, and this output per minute bears no relation to the presence or absence of congestive failure. In a given individual clinical improvement and the disappearance of congestive phenomena may be associated with an increase or a diminution of output, or there may be no change. In general the output of the heart per beat tends to be less in congestive failure. The metabolic rate is raised in some, normal in others. On these grounds the authors are inclined to accept the older view of back-pressure with its pulmonary distension as being the most likely explanation of the first symptoms of cardiac failure.

**Laryngeal Paralysis in Heart Failure.**—F. H. King, W. M. Hitzig, and A. M. Fishberg<sup>5</sup> record three cases of recurrent laryngeal paralysis in left ventricular failure. All three cases were instances of the arteriosclerotic type of failure of the left ventricle. In one case a woman, aged 57, had precordial pain and dyspnoea and became hoarse and remained so. She ultimately died, and it was found that about 3 cm. from the origin of the left recurrent laryngeal nerve a segment of about 0.5 cm. in length was constricted and of a bluish tint. This portion of the nerve lay between the arch of the aorta above and the left pulmonary artery below. Proximally and distally to this segment the nerve showed no changes. In the heart there was an ischaemic necrosis in the field of the left coronary artery. Marchi preparations of the nerve showed degeneration distally to the compression. A second case, a man aged 36, with hyperpiesis and precordial pain, while driving a car began to cough up

a large amount of frothy fluid. He had a vice-like precordial pain which radiated down the left arm. He was taken into hospital a week later following subsequent attacks, and five days after admission he became hoarse from left abductor paralysis. Death followed, but there was no necropsy. A third case, a man aged 33, with marked hyperpiesis and early cardiac failure, became hoarse three days after admission. There was left abductor paralysis. He died in six weeks and the left recurrent laryngeal nerve was found to show nerve degeneration distal to where it curved round the aorta. This lesion, though not uncommon in mitral stenosis, has not apparently been recorded in other cardiac diseases, and it is associated with dilatation of the pulmonary artery. In the first case the paralysis appeared soon after an attack of left ventricular failure.

**Heart Disease in Pregnancy.**—H. E. B. Pardee<sup>6</sup> discusses the question of therapeutic termination of pregnancy in cases of cardiac disease. In those patients whose ordinary activity is greatly limited because of dyspnoea or palpitation, who show marked tachycardia and dyspnoea after exercise, and in whom improvement is not seen after treatment during the fifth, sixth, and seventh months of pregnancy, therapeutic termination is indicated. Yet pregnancy may be allowed to continue if the patient is anxious to have a living child, if expert guidance can be given during the remainder of pregnancy, and if Cæsarean section can be arranged for at a suitable moment if this should be thought necessary. If patients of this type do not improve during the first three months of pregnancy the indications for termination are more imperative. Those patients who are unable to walk without dyspnoea or palpitation, or with dyspnoea on slight effort, should be treated by medical means and no operation should be undertaken except after a course of medical treatment. Of less severe types, those able to take ordinary physical activity without discomfort may be left without treatment except to protect them from undue strain during pregnancy.

**Drug Therapy in Heart Disease.**—M. H. Nathanson<sup>7</sup> has studied the effects of different drugs in restarting the heart to a normal rhythm after a standstill. His method was to try the effect of the drugs following a temporary arrest of the heart which can be induced in certain persons by pressure on the carotid sinus. The observations of Hering and others indicated that this was a temporary inactivity of the sinus node and a failure in the formation of secondary centres of impulse initiation. In 8 cases studied subcutaneous injection of *epinephrin* (adrenalin) abolished the standstill by stimulating a new centre of impulse formation in the ventricles. *Ephedrine* administration intravenously was active in three cases. *Digitalis* prolonged the period of standstill. Other substances such as calcium gluconate, caffeine sodium benzoate, coramin metrazol, and thyroxine were without effect, but *barium chloride* by the mouth was effective in one case.

D. W. Richards and A. L. Barach,<sup>8</sup> in determining the value of *high oxygen atmospheres* with patients with chronic cardiac and pulmonary insufficiency, find that in arteriosclerotic heart disease, when other remedies had failed, 4 out of 8 patients recovered their compensation and became ambulatory. One patient with coronary thrombosis and another with almost continuous attacks of angina pectoris improved and recovered their compensation under oxygen therapy. Two patients with rheumatic heart disease treated were relieved of dyspnoea and one had a partial diuresis, but none was restored to ambulatory activity. Of the patients with pulmonary fibrosis and cardio-respiratory insufficiency, five were relieved of dyspnoea and made free of symptoms. Two only of the five patients were restored to ambulatory activity. The "oxygen deficit" of the tissues is probably the best criterion of the need for



increased oxygen in the inspired air, and the best practical estimate can be made from clinical observations, and the following are the most important symptoms and signs in their order of importance: (1) Dyspnoea, including orthopnoea, paroxysmal dyspnoea, and Cheyne-Stokes respiration; (2) Restlessness; (3) Cardiac pain; and (4) Cyanosis. Cyanosis is a poor criterion of the degree of oxygen need, as it may be deep with a normal arterial saturation.

E. Podolsky<sup>9</sup> finds that injections of *dextrose* in heart disease are of considerable benefit. He gives a 5 to 30 per cent solution in amounts which vary from 5 to 20 c.c. per kilo of body weight. He also gives it intramuscularly and subcutaneously. Mention is made of this method with insulin as being used by several investigators. Dextrose therapy is also recommended for left ventricular insufficiency, especially in the early stages. Occasionally anginal pain is reported after the injection, and the author compares this with the coronary occlusion that may occur following insulin injection. It is not recommended, therefore, in diabetic patients or in those with an abnormal sugar metabolism.

M. O. Raven<sup>10</sup> recommends *salyrgan* as being useful in pulmonary oedema, and also suggests that it is useful in preventing the attacks of dyspnoea in which pulmonary congestion has a part as seen in heart failure.

J. B. Carter and E. F. Traut<sup>11</sup> have investigated the effect of various drugs for the relief of extrasystoles, which, though seldom serious, are often uncomfortable and disturbing to the patient. They found that *quinidine* and *strychnine* in combination gave the best results. Quinidine is given in doses of 3 gr. thrice daily and strychnine in ordinary therapeutic doses such as  $\frac{1}{16}$  gr. daily. The combination of the two drugs is far better than either separately. In one case in which extrasystoles accompanied mild decompensation there was clinical improvement.

**PROGNOSIS IN HEART DISEASE.**—In writing of the remote prognosis in heart disease from the point of view of life insurance C. C. Birchard<sup>12</sup> makes some interesting observations. Thus in a systolic blood-pressure of 145 mm. the excess of mortality over the normal will be 40 per cent at 30 years of age, 50 per cent at 45, and 60 per cent at 60. Much more serious are increases in the diastolic pressure. At 100 mm. of mercury the mortality is 60 per cent increased. At 105 it is 150 per cent increased. Again, in regard to the presence of extrasystoles, there is a 15 per cent extra mortality in those who have 5 extrasystoles or less per minute, 25 per cent in those who have 5 to 10 per minute, and 50 per cent extra mortality when the number is over 10 per minute. The so-called nervousness which gives rise to moderate but persistent tachycardia in which the pulse-rate is between 90 and 100, though the patient seems in excellent health, gives a death-rate of 47 per cent in excess of the normal. Slow pulse, on the other hand, between the rate of 55 and 65, gives death-rates 15 per cent below the average for normal lives. In those with an apical bruit constant in all postures and transmitted towards the axilla, but without enlargement and with no history of rheumatism, the extra mortality is 56 per cent. In the method of calculation of percentages each 10 per cent extra mortality beyond the normal is roughly equivalent to adding one year to the age.

REFERENCES.—<sup>1</sup>*Edin. Med. Jour.* 1935, xlii, 117; <sup>2</sup>*Ann. of Surg.* 1935, ci, 478; <sup>3</sup>*Arch. of Internal Med.* 1935, lv, 112; <sup>4</sup>*Ibid.* 1934, liv, 239; <sup>5</sup>*Amer. Jour. Med. Sci.* 1934, clxxxviii, 691; <sup>6</sup>*Jour. Amer. Med. Assoc.* 1934, ciii, 1899; <sup>7</sup>*Arch. of Internal Med.* 1934, liv, 111; <sup>8</sup>*Quart. Jour. Med.* 1934, xxvii, 437; <sup>9</sup>*Abstr. in Jour. Amer. Med. Assoc.* 1935, civ, 1672; <sup>10</sup>*Lancet*, 1934, ii, 1220; <sup>11</sup>*Amer. Jour. Med. Sci.* 1935, clxxxix, 206; <sup>12</sup>*Canad. Med. Assoc. Jour.* 1935, xxxii, 47.

**HEART DISEASE, CONGENITAL.***A. G. Gibson, M.D., F.R.C.P.*

In an article on congenital heart disease, D. C. Muir and J. W. Brown<sup>1</sup> bring together some important practical points. They give a list of 212 cases which they have studied in the rheumatism and heart clinics of Hull and Lindsay. They have subdivided these cases into : (A) Those of no clinical significance, such as mirror dextrocardia ; and (B) Those of clinical significance, including (1) the acyanotic group, (2) the group with occasional or terminal cyanosis, and (3) the permanently cyanotic group. Of the numerous defects that can be identified or suspected four come out as of much greater frequency than the others. These are : In group B (2)—intraventricular septal defects with 37·7 per cent, patent ductus arteriosus with 19 per cent ; in B (1)—subaortic stenosis with 9·5 per cent ; and in B (3)—the tetralogy of Fallot (pulmonary stenosis, ventricular septum defect, dextro position of the aorta, and hypertrophy of the right ventricle) with 7·5 per cent.

The paper terminates with some very practical remarks on treatment. The authors regret that, for the majority, cardiac abnormalities when discovered are the signal for putting the patient on severe restrictions which they think are completely unjustifiable in the acyanotic group except in certain instances. Patients with the *maladie de Roger* (intraventricular septal defect), patent ductus arteriosus, and subaortic stenosis rarely present no symptoms referable to the heart. The authors agree to some supervision in patients with coarctation. Each case, however, must be judged on its merits, and except in the gravest cases, such as show convulsions or hæmorrhage, exclusion from school is a mistake. The cyanotic group can never become manual labourers, and schooling, therefore, is important. They have not noted mental defect or mental retardation in these patients. Fibrillation is seen mostly in those with an auricular septal defect. Congestive failure is rare. Venesection is those deeply cyanosed is a useful procedure. The commonest causes of death are pulmonary tuberculosis, infective endocarditis, and syncope, in that order of frequency. All patients should have an X-ray photograph. While in the elementary school child it is perhaps best to impose no restrictions on activities outside school, this would hardly be right in the reviewer's opinion in the secondary schools, where organized games and competitive athletics might be an extra strain on the heart. It is doubtful whether any patient with a mechanical defect can properly support competitive athletics. Under supervision, however, all athletics may be tried, and the deciding feature should be enlargement of the heart.

REFERENCE.—<sup>1</sup>*Brit. Med. Jour.* 1935, i, 966.

**HEART FAILURE, THYROIDECTOMY IN.** (*See also* THYROID.)*A. G. Gibson, M.D., F.R.C.P.*

Several papers dealing with the effect of total thyroidectomy in cardiac failure and angina pectoris have appeared since the publication of the last MEDICAL ANNUAL. C. Eggleston and S. Weiss<sup>1</sup> say that by the adoption of local anæsthesia they have almost eliminated post-operative anæsthetic mortality. They use local infiltration with *procain*. This infiltration, by separating tissue planes, has rendered surgical technique easier. One danger lies in damage to the recurrent laryngeal nerve, which can be guarded against by a laryngeal examination before the operation and again after the dissection of one lateral lobe has been completed. Should the second examination show paralysis of the homolateral vocal cord, the operation is terminated. Paralysis of one vocal cord is not dangerous to the patient. In ordinary cases every vestige of the thyroid gland must be removed to prevent regeneration and the restoration of the basal metabolism to normal. It is necessary in removal to

remember that 35 per cent of patients possess a pyramidal lobe of the thyroid. Myxœdema only appears when the metabolism is lowered to 30 per cent. Diminished vital capacity of the lungs is constant in congestive failure and it has been shown that this is much lowered with a lowered metabolism and in spontaneous myxœdema. Although such patients might be free from congestive heart failure, the vital capacity following thyroidectomy is increased in some and unchanged in others, though both may be relieved of their obvious respiratory symptoms. The blood-pressure is not significantly altered by thyroidectomy, and the electrocardiogram shows a lowered voltage of the QRS complex and less frequently a lowered amplitude of the T waves. One of the most striking effects has been the frequent prompt and complete relief of pains and aches in the chest. Recurrent hæmoptysis was also relieved in several patients. Paroxysmal dyspnœa has not been benefited. Patients with the anginal type of cardiac failure seem to be more benefited than those with the congestive type. The authors remark on the lack of response to adrenalin which follows complete thyroidectomy. Of 73 patients none showed any spasm of tetany, though 17 per cent had slight symptoms of hypoparathyroidism, and the presence of paræsthesia or of Chvostek's and Trousseau's signs was seen. The best results from total thyroidectomy are obtained in those patients with chronic congestive failure due either to rheumatic or hypertensive processes who can be restored to compensation when at rest in bed. Those who do not respond to rest in bed and ordinary medical treatment are likely to derive little benefit from the operation, and in them also the operation is hazardous.

A successful series of cases is reported also by O. Brenner, H. Donovan, and B. L. S. Murtagh,<sup>2</sup> whose conclusions are practically the same as other writers. Only 2 out of 6 patients showed signs of hypothyroidism.

J. Hepburn<sup>3</sup> records 5 successful cases of thyroidectomy in cardiac disease. In 1 of these the attacks of angina pectoris had followed an early attack of coronary thrombosis. The experience suggests that improvement can follow total thyroidectomy in severe angina pectoris, in those suffering from attacks at rest.

D. D. Berlin, H. L. Blumgart, A. A. Weinstein, J. E. F. Riseman, and D. Davis<sup>4</sup> come to the same conclusions as the previous writers. They agree that cardiac failure resistive to treatment does not give a hopeful outlook, and 4 of this 6 patients who died soon after operation were in congestive failure at the time. They are of opinion that patients should not be subjected to operation in the presence of signs of congestive failure. Minimal doses only of sedatives should be given at the pre- or post-operative stage, in order to diminish the tendency to bronchopneumonia. Most of their patients received 3 gr. of sodium amylal on the night previous to operation and on the morning of operation and  $\frac{1}{6}$  gr. of morphia before leaving the operating theatre. No attempt was made to narcotize the patients.

In regard to rheumatic heart disease, 29 patients were subjected to total thyroidectomy, and 25 of these had congestive failure, 2 of whom had angina pectoris at the same time. The effects of operation are too recent to warrant any conclusions. This is also the opinion of C. Lian, H. Walti, and J. Facquet,<sup>5</sup> who in 3 cases of thyroidectomy in rheumatic valvular disease with congestive failure produced a marked diminution in symptoms, with improvement in the dyspnœa, return of the liver to normal size, and of the venous pressure to a normal level. They remark on the relatively insignificant signs of thyroid insufficiency.

Of 20 patients who were operated on for congestive failure, Berlin and his colleagues state that 11 have maintained compensation for four to eighteen months in spite of indulging in activity previously impossible. Of these 20

patients, 4 had recurring failure after the operation and 3 of them are dead. The conclusions in the discussion which followed this paper indicated that thyroidectomy has a definite place in the treatment of serious cases of cardiac failure, but that its application should be limited to those likely to improve, that it lessens a load on the damaged heart, but that it cannot in any sense replace a damaged heart by a good one. It forms a method of treatment after all other available therapeutic measures have failed, but no patient in what might be referred to as the terminal stages of heart failure should be subjected to it.

REFERENCES.—<sup>1</sup>*Amer. Jour. Med. Sci.* 1935, clxxxix, 727; <sup>2</sup>*Brit. Med. Jour.* 1934, ii, 624; <sup>3</sup>*Canad. Med. Assoc. Jour.* 1935, xxxii, 390; <sup>4</sup>*New Eng. Jour. Med.* 1934, cexi, 563; <sup>5</sup>*Bull. et Mém. Soc. nat. de Chir.* 1935, lxi, 479.

### HEART IN MYXŒDEMA.

A. G. Gibson, M.D., F.R.C.P.

M. Campbell<sup>1</sup> reports that the heart in myxœdema is increased in size owing probably to dilatation. This increase rapidly diminishes by giving *thyroid* and is therefore not consistent with hypertrophy. It is not caused by increased pressure, for this may be absent with an enlarged heart. In the electrocardiogram the T waves are flat, and both this feature and the dilatation before ought to be correlated with the lowered basal metabolism. Slight congestive failure with dyspnoea may be present, and more rarely gross congestive failure. Both these conditions are relieved by thyroid treatment. The slight anæmia present in these cases clears up also with treatment.

REFERENCE.—<sup>1</sup>*Guy's Hosp. Rep.* 1934, lxxxiv, 291.

### HEART SOUNDS AND MURMURS.

A. G. Gibson, M.D., F.R.C.P.

Two important articles by Crichton Bramwell<sup>1</sup> deal with *intermediate cardiac sounds* that may be heard in some cases. That sounds may be produced by the contracting auricle has been known since 1858, when they were heard ninety minutes after death in a criminal. On opening the chest it was found that the auricles alone were beating at 80 per minute. Again in those types of arrhythmia in which auricular and ventricular systole may occur simultaneously the first heart sound may be reinforced by the auricular. In heart-block also the auricular contractions may sometimes be heard; and also in Graves' disease. Bramwell has proved by comparison of the electrocardiograph and a record of the cardiac sounds that the P wave corresponds to the presystolic sound. The prolongation of the first sound and the suggestion of a presystolic element in three Marathon runners also appear to be explained by the fact that auricular systole was audible, and this was proved by graphic records. The author suggests that the hypertrophy that occurs in athletes who indulge in prolonged and severe physical exertion also affects the auricles. A similar graphic record from a case of congenital heart disease suggested that the auricular sound was accentuated. These presystolic vibrations which constitute the auricular component of the first heart sound correspond in time to the presystolic vibrations which give the characteristic thrill and murmur in cases of slight mitral stenosis. Whereas in mitral stenosis the size of the orifice is diminished, it is normal in hyperthyroidism, but the rate of blood-flow is increased, serving therefore to produce a relative stenosis. If auricular systole occurs early in diastole the murmur is loud, but if it occurs late the murmur is faint.

In the paper on *gallop rhythm*, Bramwell describes this feature as the cry of the heart for help and an indication that the last reserves have been called up. It is necessary to distinguish gallop rhythm from the normal third heart sound and the asynchronous closure of the aortic and pulmonary valves,

neither of which has the same prognostic significance. The third heart sound is often audible in patients with mitral stenosis, in whom true gallop rhythm is hardly ever found. The third heart sound is related to the foregoing systole and occurs in a definite relation to the second heart sound of the previous systole. This is what is sometimes known as protodiastolic gallop rhythm. The third heart sound is seldom heard in cases when the heart is embarrassed. It is much more often an incidental feature in a routine cardiac examination. In split heart sounds the two components are of the same quality and pitch and separated from one another by a very short interval. True gallop rhythm always occurs when the heart is beating rapidly. It is palpable as well as audible, and the accessory sound is often only a dull thud. The accessory sound is often less audible than palpable, and the best way of detecting it is by applying the ear direct to the chest wall. The normal cardiac impulse is a single thrust, but the gallop impulse is a double wave and gives the impression that the chest wall is not only being pushed out by the turgid apex of the ventricle but that it is being thrown into oscillation. In 63 patients studied there was a very high mortality. Tachycardia was invariable. In 7 cases the electrocardiogram showed bundle branch block. Over 83 per cent of the total were dead in eighteen months. It occurred most frequently in patients with hypertension, advanced coronary disease, or advanced inflammatory lesions of the heart with congestive failure, anginal pain, or cardiac asthma, and is therefore a grave sign in prognosis. It does not appear to have any etiological relation to heart-block or bundle branch block.

REFERENCE.—<sup>1</sup>*Quart. Jour. Med.* 1935, iv, 139, 149.

### HEART-BLOCK.

A. G. Gibson, M.D., F.R.C.P.

K. Gordon<sup>1</sup> gives an account of some of the clinical features of complete heart-block. In a series of 9 cases from the Montreal General Hospital the blood-pressure was normal in 1 only. In the other 8 the average systolic blood-pressure was 204 mm., while the average diastolic pressure was 83 mm. In all patients the heart was found to be enlarged both by physical examination and by X-rays. In 2 patients there was no cardiac murmur, in 7 there was an apical systolic murmur, and in 1 of these there was an apical diastolic murmur as well. On no occasion was a variable first heart sound recorded. Capillary pulsation was recorded in 1 patient, but none is recorded as having a collapsing pulse. It is suggested that attention to these points may enable the diagnosis of heart-block to be confirmed. It should be noted that in the majority of patients with heart-block the auricular pulse is clearly visible in the veins of the neck between the ventricular beats. In order to observe this it is necessary to put the patient on his back and to have a diffused light striking the neck obliquely. At night time it is often possible, by so directing the rays of a hand torch, to show up these beats very clearly. It can also be seen that when the auricular and ventricular beats coincide the wave in the jugular vein is much stronger. By careful auscultation also the sound of the beating auricle can sometimes be recognized at the base of the heart.

In writing of the effects of bodily rest, muscular activity, and induced pyrexia on the ventricular rate in complete heart-block, A. R. Gilchrist<sup>2</sup> says that muscular exercise increases the rate of the ventricle to a varying degree. In one patient it increased a number of beats per minute by 50, from 40 to 90. In another the increase was between one and two beats. This capacity of ventricular increase on exercise varies considerably in different individuals, and similarly the rate of return to normal is inconstant. Symptoms may occur within a minute of completing the test; in other patients up to five minutes may elapse before the resting conditions are restored.

In regard to the auricular rate as compared with the ventricular, an increase of 150 per cent in the rate of the auricles may be accompanied by only 10 per cent in that of the ventricles. On the other hand, a 50 per cent gain in the rate of the auricles may coexist with 100 per cent gain in the rate of the ventricles. The patient is more severely incapacitated when the ventricle has a small increase of rate on exercise. The ventricular rate in three patients was slower during sleep than when awake. Both fever and protein shock raise slightly the rate of the ventricles. It would appear that both the sino-auricular node and the idio-ventricular centre react individually to stimuli.

W. A. R. Thomson<sup>3</sup> deals with so-called Type 2 of partial auriculo-ventricular block, described in 1906 by Hay. In this type, though there is a slight prolongation of the As-Vs interval, this interval shows no variation, whether the ventricular rate is 60 or 30 per minute. The normal form of partial block shows a gradual lengthening of the As-Vs interval in successive cardiac cycles until a ventricular beat is dropped. This follows an interval in which there is little or no delay. Out of 44 cases of partial auriculo-ventricular block, 1 only could be identified as of this type. Type 1 is obviously due to an alteration in the power of conductivity, and Thomson confirms Hay's explanation that Type 2 is a diminution of ventricular excitability. He quotes Motitz, who states that Type 2 is of more serious import because it may be the precursor of the Adams-Stokes syndrome, and it is in this type also that abrupt transitions are seen from apparently normal conduction to temporary complete block or the reverse.

REFERENCES.—<sup>1</sup>*Canad. Med. Assoc. Jour.* 1934, xxxi, 171; <sup>2</sup>*Quart. Jour. Med.* 1934, xxvii, 381; <sup>3</sup>*Edin. Med. Jour.* 1934, iv, 605.

## HERNIA.

A. Rendle Short, M.D., F.R.C.S.

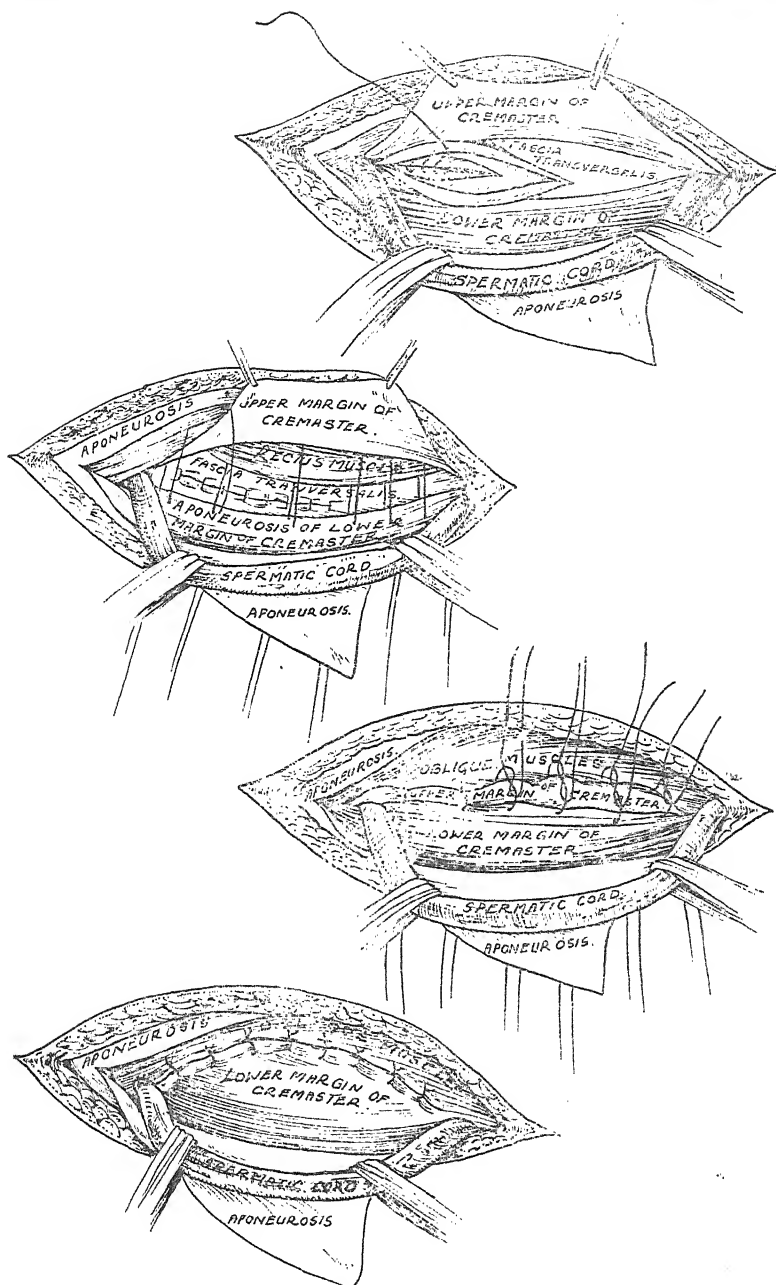
This year, as ever, an embarrassing number of new or modified operations for hernia, especially inguinal hernia, are described; with some of these we do not think it worth while to burden our pages, or our readers' attention.

### Inguinal Hernia.—

*Injection Treatment.*—We have often noticed this method in former numbers of the MEDICAL ANNUAL, though it does not seem to gain many adherents. S. W. Fowler,<sup>1,2</sup> of New York, has two papers on the subject. He injects *galtanol*, 2 c.c. on twelve to fifteen occasions; a truss must be worn throughout the treatment. He says the recurrence rate is very low. He has treated 700 cases. De Lisle Gray<sup>3</sup> continues to use the solution mentioned in the MEDICAL ANNUAL for 1933 (p. 214); it is turbid in the cold but clears on heating. The injection is made not into but around the sac, and about twenty injections may be needed, at intervals of four days. He claims 75 per cent of satisfactory results.

*Operation Treatment.*—Professor G. Baggio,<sup>4</sup> of Cagliari, has a modification of the Bassini operation, shown in Figs. 27–30. It will be observed that the cremaster muscle is dissected off the cord, split, and sewn up behind the cord. First the sac is cut away and over-sewn, then the transversalis fascia is sewn up, then the lower flap of the cremaster is sewn to the rectus muscle and the internal oblique.

To avoid the necessity of cutting the thigh to obtain strips of fascia lata for the Gallie operation, J. W. Levering,<sup>5</sup> of Philadelphia, has experimented in dogs with strips of peritoneum, and finds it is quite efficient. He suggests that strips of the hernial sac might be used. R. P. Wadhams and V. Carabba<sup>6</sup> use a living pedicled graft from the fascia lata cut from the upper part of the thigh, pulled subcutaneously into the gap between the external oblique and Poupart's ligament on the outer side and sewn to the rectus sheath on the inner



Figs. 27-30.—Baggio's operation for inguinal hernia.

(*PLATE XXXVII*). O. H. Wangenstein,<sup>7</sup> of Minneapolis, also uses a pedicled flap from the iliofemoral band; his flap is a broad one which may be utilized to repair large-gap hernias in the inguinal or femoral region or in the abdominal wall. The tensor fasciæ femoris muscle, with its artery and nerve intact, is swung as the pedicle of the flap. It is drawn above or beneath Poupart's ligament.

**Physical Efficiency after Operation.**—Max Page<sup>8</sup> has been investigating the end-results of operation for inguinal hernia in the London Police Force, where the recurrence rate appears to be about 11.5 per cent. He quotes the enormous figures of Block, from German clinics; of 18,220 Bassini operations, 177 or 4.2 per cent recurred. Contrary to the general opinion, which is that the first year is the period of recurrence, in over a third of the cases in Block's series the hernia came back more than two years after the surgical intervention. The main avoidable cause of failure was hæmatoma or suppuration (122 out of 548 cases). The use of catgut, silk, thread, or silkworm, made no substantial difference.

**Femoral Hernia.**—R. S. Melville,<sup>9</sup> of Dundee, modifies Lotheisen's operation, the one now usually used for femoral hernia, and very satisfactorily as far as preventing recurrence is concerned. Melville ties off the sac flush with the peritoneum, approaching it above Poupart's ligament; the lower part of the sac is left to plug the femoral canal; it is turned inside out to make a rivet-like 'head' on the upper side of Poupart's ligament. R. L. Payne,<sup>10</sup> of Norfolk, Virginia, uses living fascial sutures to approximate the internal oblique to Cooper's ligament (ligamentum pubis).

**Incisional Hernia.**—Large difficult recurrent incisional hernias, always a problem, have been successfully closed by N. S. Rothschild<sup>11</sup>, of Philadelphia, by means of flaps cut from the anterior sheath of the rectus abdominis. These are cut square or oblong, on either side of the gap, with a hinge on the mesial side; they are then turned over in front of the gap and sutured, overlapping one another. It is important to avoid post-operative abdominal distension, and a Jutte tube may be left in the stomach. According to C. D. Branch,<sup>12</sup> of Harvard, there were 40 recurrences in 204 cases operated on by standard methods. Three of these followed a Gallie repair.

**Occult Epigastric Hernia.**—An article on this subject is contributed by N. Bardesco,<sup>13</sup> of Bucharest. These little fatty herniæ, in the mid-line between the xiphisternum and the umbilicus, are easily overlooked, and may give rise to symptoms very like those of gastric ulcer. Bardesco reports on 11 cases treated by operation, which relieved their pains.

**Diaphragmatic Hernia.**—Sir T. Dunhill<sup>14</sup> chose this for his subject for the Arris and Gale Lecture for 1934. The type associated with a short œsophagus is not uncommon. The symptoms of diaphragmatic hernia are usually severe, and quite suggestive, but the diagnosis mainly depends on the radiogram. Operative treatment, though not without risk, can cure those patients in whom the œsophagus is of normal length; Dunhill has had six successful cases. The stomach may be so large that there is barely room in the abdomen for it, and a temporary gastrostomy is useful. The hole in the diaphragm may be: (1) Just behind the sternum; (2) Through the left dome; (3) Through the left costo-vertebral angle; (4) Close to the œsophagus, which may be normal or very short.

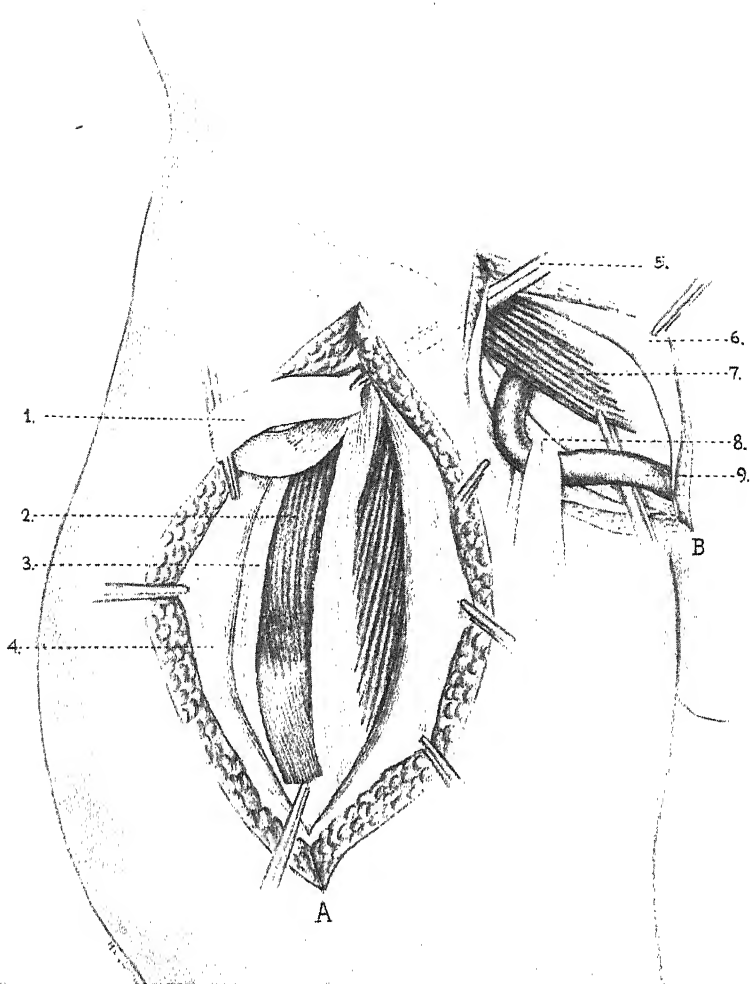
REFERENCES.—<sup>1</sup>*Med. Record*, 1935, Feb., 207; <sup>2</sup>*Ibid.* April, 387; <sup>3</sup>*Proc. Roy. Soc. Med.* (Surg. Sect.), 1934, July, 1289; <sup>4</sup>*Policlinico*, 1935, May, 1019; <sup>5</sup>*Ann. of Surg.* 1935, Jan., 550; <sup>6</sup>*Ibid.* May, 1264; <sup>7</sup>*Surg. Gynecol. and Obst.* 1934, Nov., 766; <sup>8</sup>*Brit. Med. Jour.* 1934, ii, 896; <sup>9</sup>*Ibid.* 1935, i, 487; <sup>10</sup>*Jour. Amer. Med. Assoc.* 1935, Jan., 276; <sup>11</sup>*Ann. of Surg.* 1935, Feb., 754; <sup>12</sup>*New Eng. Jour. Med.*, 1934, Nov., 949; <sup>13</sup>*Rev. de Chir.* 1934, Oct., 589; <sup>14</sup>*Brit. Jour. Surg.* 1935, Jan., 75.



## PLATE XXXII

### INGUINAL HERNIA

(R. P. WADHAMS AND V. CARABBA)



*A*, Incision in thigh, showing preparation of fascial flap. *B*, Inguinal herniotomy up to and including treatment of sac. 1, Flap of tensor fascia lata; 2, Tensor fascia lata muscle; 3, Tensor fascia lata; 4, Deep fascia of thigh; 5, Clamp underneath external oblique; 6, External oblique aponeurosis; 7, Conjoined tendon; 8, Reflected edge of inguinal ligament; 9, Spermatic cord.

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**HERNIA, UMBILICAL.***A. Rendle Short, M.D., F.R.C.S.*

Very little has appeared in medical literature on this subject for a good many years, and it seems opportune to make some reference to the allied conditions of exomphalos, umbilical hernia in children and adults, and divarication of the recti.

**Exomphalos** is an inborn defect in which the intestines are herniated at the umbilicus at the base of the umbilical cord, covered only by a thin transparent membrane. Too often in the past it has been concluded that the infant has no chance of survival. If nothing is done, of course, the child soon dies of peritonitis or of intestinal obstruction. It has been our practice of late years to operate within the first twenty-four hours, with the aid of a little ether anaesthesia; to excise the thin membrane, reduce the prolapsed bowel, and close the abdominal muscles over the gap. Early operation is usually successful. One case that seemed hopeless, brought up on the third day, and showing signs of local peritonitis, made a good recovery.

**Umbilical Hernia in Children** is, of course, very common, does no harm, and gets well of its own accord in the course of a few months. It has been customary to treat it by sewing a coin or a cork disc into the binder, but there is no advantage in this; a firm binder is quite sufficient. A pad and a piece of sticking plaster is often recommended, but it is apt to excoriate the skin.

Sometimes the mother becomes impatient, and desires that something more definite shall be done. In that case there is a simple and successful treatment available—namely, to pass a stout silkworm stitch subcutaneously around the neck of the sac by means of a curved needle and to tie it tight. The method is only suitable if the bowel is reducible, and the hernia no bigger than the tip of the finger. If the hernia is large, or in very rare cases that strangulate, an open operation may be necessary.

**Umbilical Hernia in Stout Middle-aged Women** is a common, often neglected, but quite serious condition. It is difficult to treat, and carries considerable risk of strangulation, besides giving rise to a good deal of discomfort and disability. If strangulation occurs, the operation mortality is in the neighbourhood of 30 per cent. Choice of treatment lies between an abdominal belt and surgical repair, and it is often difficult to decide which is better. The patient is usually not a promising subject for surgery, but, on the other hand, even a well-fitting belt will probably fail to prevent the hernia steadily increasing and reaching a great size. At operation a transverse incision, with excision of the umbilicus and a large piece of skin, is best; the bowel may be very close to the skin and adherent, and care must be taken to avoid wounding it. The sac is then dissected away down to its neck, and the rectus muscles and sheath plainly exposed. Closure is effected in three layers. First the sac and posterior sheath are sewn up transversely, either separately or together; it is valuable to overlap the sheath of rectus like a double-breasted waistcoat. Next the rectus muscles are united vertically. Finally the anterior sheath, overlapped if possible, is sewn up transversely. If the gap is wide, strips of living fascia lata should be used for suturing the muscles or the anterior sheath. If these cannot be brought together without great tension, a sheet of fascia lata, with tails like a many-tailed bandage, may be sewn into the gap. Or strips of bone from the anterior surface of the tibia may be incorporated to bridge the gap. They heal in well, but there is a tendency for recurrence to take place between or adjacent to them. Bartlett's filigree method is probably not much used nowadays; it often gave good results, but there is a specimen in the Museum of the Bristol Royal Infirmary from a case in which it led to fatal intestinal obstruction.

Divarication of the Recti is usually seen in the aged or the emaciated, and nothing but skin and peritoneum lies in front of the intestines over an area 2 or 3 in. wide between the recti, so that there is visible peristalsis. An abdominal belt is all the treatment that is needful.

**HIP.** (*See also* JOINTS, SURGERY OF.)

### **HIP, CONGENITAL DISLOCATION OF.**

*E. W. Hey Groves, M.S., F.R.C.S.*

*K. H. Pridie, F.R.C.S.*

It is a matter of common agreement that there are three phases of congenital dislocation of the hip and that the problems of treatment are entirely different in each. In the first—that of infancy—it is usually possible to replace the dislocation and to maintain the corrected position by plaster-of-Paris. In the second, closed reduction is very difficult or impossible, and some type of open operation is necessary. The operation may be merely placing the head into its socket after dividing the constricted portion of the capsule, but more usually the shallow acetabulum must be deepened either by gouging away its floor or by adding a shelf above. In the third phase—that of the adolescent or adult—the choice will lie between palliative treatment and some kind of reconstructive operation. It is not possible or desirable to make a hard-and-fast age limit between these three phases. As a matter of experience, however, it is found that the first phase, when closed manipulation is the treatment of choice, is from one to three years; but it can often succeed up to five or six years.

Two facts in relation to closed reduction are becoming more and more definitely established. First, that the younger the patient is, the better. Eighteen months in this country is usually the earliest age that the diagnosis is made, i.e., when delay in walking calls attention to the need for diagnosis and an X-ray is taken. Second, that violence or any form of brute force is not only unnecessary but positively harmful. The difficulty in closed reduction in a child of 3 to 6 is caused by contraction of the elongated capsular ligament. No amount of violence will overcome this. Force merely serves to tear the attachment of the capsule and to double it up between the head and the socket. When this has been done, the head may be retained for months, lying insecurely opposite to the acetabulum, but when finally the cast is removed, dislocation recurs. Therefore in this second phase the safe rule is to begin with traction and abduction continued for a week or two, and then to manipulate. Satisfactory reduction is indicated by an unmistakable click which is both palpable and audible. Then the position is maintained by the usual double hip spica, and is continued for nine to twelve months, being changed every three months, the abduction being lessened at every change. If satisfactory reduction cannot be achieved, then an open operation, usually of the shelf type, should be done.

In the third or adult phase decision as to the best treatment is most difficult. The patient may be quite agile, active, and free from pain. Under these circumstances, and especially in cases of bilateral dislocation, it is probably wise to refrain from operation. It is very easy to convert such an active and painless condition into one which is stiff and painful. Probably, therefore, these late cases should be advised to carry on with provisional appliances for equalizing the length of the legs. Operation should be deferred until pain, tiredness, and instability occur.

In the present article discussion will be confined to the best method for open operation in children and adults. If there is a well-formed acetabulum, which is very rare, then operation will merely consist in dividing the constriction

in the capsule and in replacing the head. But in the great majority of cases the socket is much too shallow to retain the head and either must be deepened or else a shelf added above.

F. D. Dickson<sup>1</sup> describes the shelf operation as commonly performed, and from which he claims to have had good results in 23 out of 28 cases. A piece of bone is turned down above the acetabulum and wedged in place by a triangular graft cut from an adjacent portion of the crest of the ilium (*Plate XXXIII*). It is a little difficult to understand how such a small shelf can "afford enough security, especially when the hip is flexed. It is much more efficient if the whole upper margin of the acetabulum is divided from the pelvis by a chisel, and a massive graft driven in to keep it in place. Some attach importance to operating without opening the capsule, but this should be quite a secondary consideration. It is very seldom that an open operation is done on any case

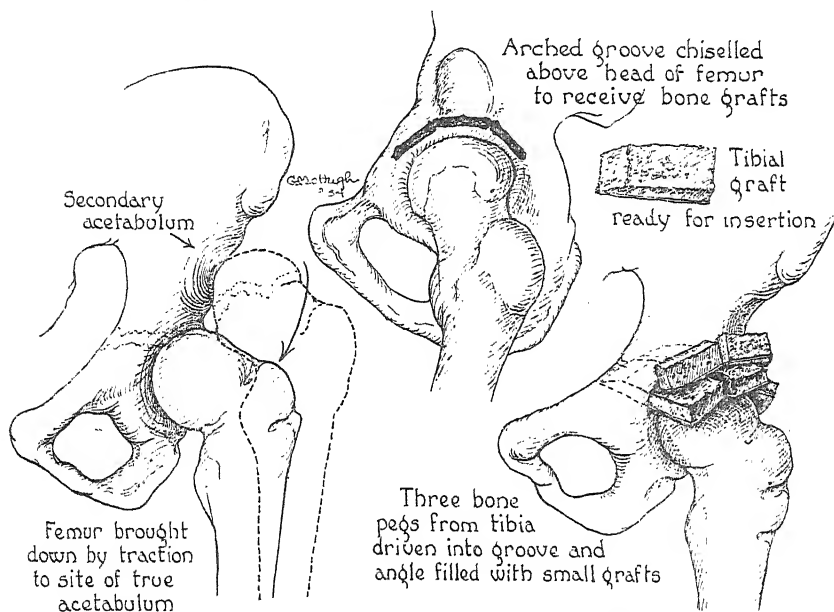


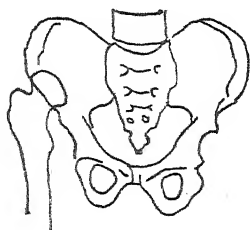
Fig. 31.—Diagrammatic illustration of Compere's tibial-peg-shelf operation in congenital dislocation of the hip. (By kind permission of the *Journal of Bone and Joint Surgery*.)

in which closed reduction can be effected. The shelf operation is usually done through an anterior Smith-Petersen incision; but there are great advantages in using an external goblet  $\nabla$  incision, turning up the great trochanter. This gives much the best exposure of the whole superior, anterior, and posterior aspects of the acetabulum. Probably most shelf operations err on the side of leaving the posterior part of the upper rim of the socket unprotected. Having exposed the upper acetabular margin, it is necessary to make a bony ridge or shelf along at least one-third of its upper circumference. The easiest way is to take a part or parts of the anterior superior spine and crest, which in children is still covered in cartilage, and nail these on above the acetabulum. But the majority of operators, like Dickson, turn down an osteo-periosteal flap and wedge this with the graft. Actually a dead bone-graft may be shaped

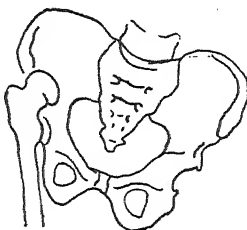
beforehand and nailed in place with bone nails. E. L. Compere<sup>2</sup> uses stout nails or wedges cut from the tibial crest, and drives these in round the margin of the socket (*Fig. 31*).

The problem of the older child or adult in which the head of the bone lies high up, behind, and on a level with the anterior superior spine, is a very much more difficult one. The question whether such cases should be operated on at all has already been referred to. It is very doubtful whether there is any advantage in forming a shelf above such a displaced femoral head. Bruce Gill,<sup>3</sup> however, is of opinion that such a shelf operation does give some stability and freedom from pain (*Plates XXXIV, XXXV*).

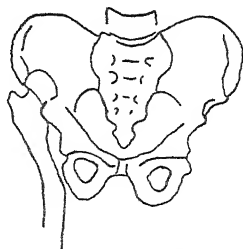
The femoral head in old cases of dislocation is displaced in three directions—upwards, outwards, and backwards. The upward displacement is most obvious in the X-ray. It can always be lessened, if not wholly corrected, by preliminary skeletal traction, aided maybe by tenotomy of the adductor tendons. The shelf operation should then prevent further slipping upwards of the head. The backward displacement is too often overlooked. It is responsible for the lordosis. Dickson<sup>1</sup> rightly insists that it should be fully corrected as an essential part of any open operation. That is to say, the head of the femur must be levered forward so as to be in contact with the anterior plane of the pelvis; so that when viewed laterally the head of the femur should be in the same plane as the lumbar spine. The outward displacement is that which is usually overlooked or untreated. And yet it is very important as being responsible chiefly for the rolling gait. In nearly all the shelf operations, an antero-posterior X-ray shows that the head of the femur still lies lateral to the line of the sacro-iliac joint, whereas it ought to lie vertically below it if real stability is to be attained. There are only two ways in which the line of the femur can be shifted in a medial direction, one directly and the other indirectly. The direct method consists in deepening the acetabulum by gouging out its floor so as to leave the rim jutting out. The indirect method consists in a subtrochanteric osteotomy, angulating the shaft of the femur on the neck so that the former comes to lie in the same line as that of the sacro-iliac joint.



*Fig. 32.*—Relation of pelvis and femur during weight-bearing on both legs.



*Fig. 33.*—Sinking of pelvis during advancement of the second leg.



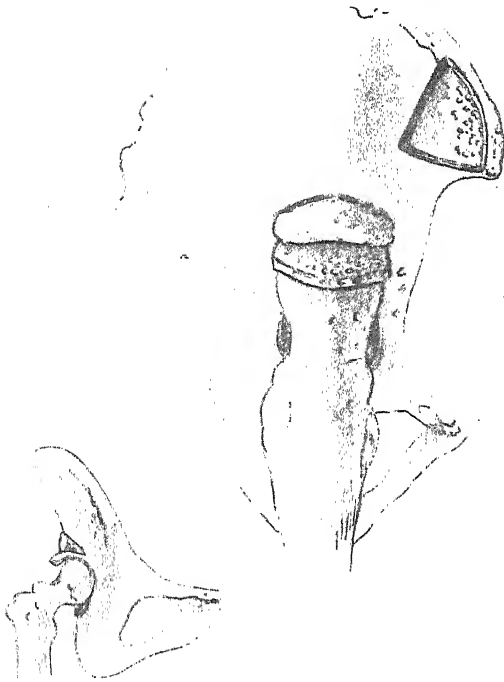
*Fig. 34.*—Pelvis finding support on the proximal portion of the shaft after Schanz osteotomy.

There can be no doubt that in most adult cases, especially with bilateral dislocation, some form of osteotomy is the safest and best method of treatment. F. J. Gaenslen<sup>4</sup> describes and advocates the type of osteotomy devised by Schanz (*Figs. 32-34*). The special features of this operation are: (1) The division of the femur at the level of the lower border of the pelvis; and (2) Fixing with long transfixion pins or screws the two fragments of bone above and below the point of bone division and adjusting and fixing the exact angle of abduction by this means. The leg is first adducted until the shaft of the

PLATE XXXIII

SHELF OPERATION IN CONGENITAL DISLOCATION  
OF THE HIP

(F. D. DICKSON)



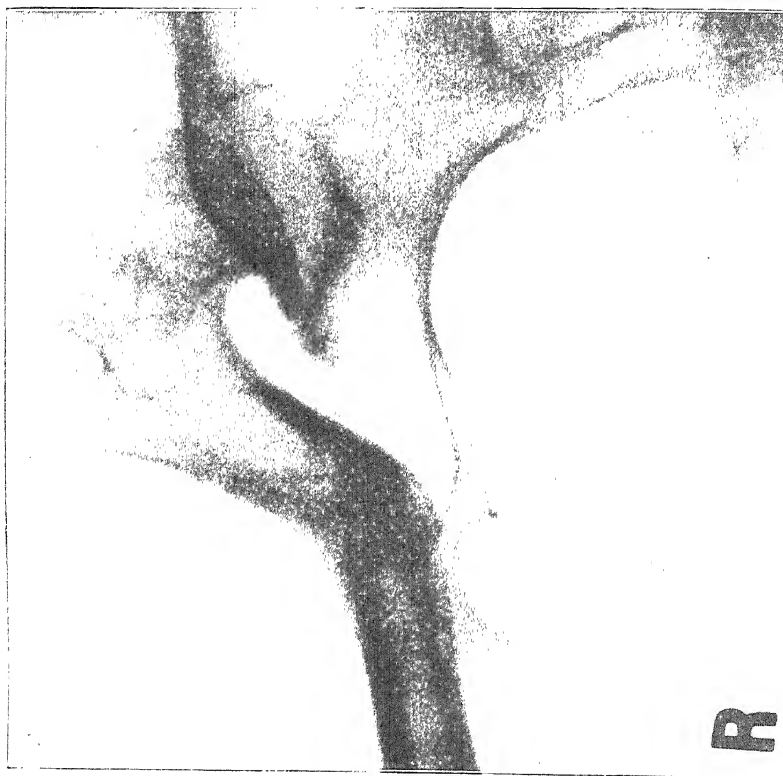
A wedge of bone has been removed from the crest of the ilium and fixed between the side of the ilium and the turned-down flap.

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PLATE XXXVI

SCHANZ OSTEOTOMY FOR CONGENITAL DISLOCATION  
OF THE HIP

(F. J. GAENSLER)



End-result after low Schanz osteotomy for congenital dislocation of the hip.

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femur locks against the side of the pelvis. The bone is divided opposite this point of contact. The angle of abduction should be exactly that made between the adducted femur and the long axis of the body, and should be measured beforehand with the help of X rays. The long screws or transfixion pins are inserted into the bone above and below the point of section, and after the osteotomy they should be angulated towards one another for exactly the pre-determined angle. They are fixed in this angle by means of a plaster cast (Figs. 35, 36). The screws are removed in four to five weeks, whilst the plaster

Schanz

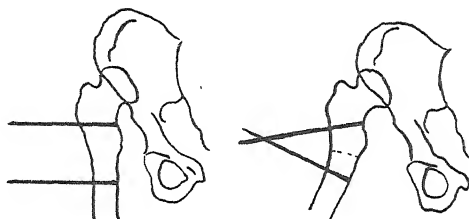


Fig. 35.—Subtrochanteric osteotomy (Schanz). Fragments controlled by Schanz screws.

Riedel

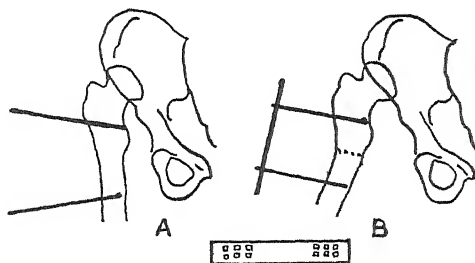


Fig. 36.—A, The oblique insertion of the screws (Riedel) allows greater working space than when screws are introduced perpendicularly into the shaft, as in Fig. 35. B, Shows screws parallel after angulation of femur and securely fixed by use of the Riedel plate which is shown in the inset.

(Figs. 32-36 by kind permission of the 'Journal of Bone and Joint Surgery'.)

cast remains on for eight weeks. This operation does not differ greatly from the ordinary Lorenz bifurcation osteotomy, done at the level of the lesser trochanter, in which the lower fragment is thrust inwards so as to engage in the acetabulum. The Schanz osteotomy (Plate XXXVI) has greater precision in the amount of angulation, whilst the Lorenz osteotomy is very efficient if the femoral shaft can be made to engage in the acetabulum.

REFERENCES.—<sup>1</sup>*Jour. Bone and Joint Surg.* 1935, xvii, Jan., 43; <sup>2</sup>*Ibid.* 60; <sup>3</sup>*Ibid.* 48; <sup>4</sup>*Ibid.* 76.

**HIRSCHSPRUNG'S DISEASE.** (See MEGACOLON, CONGENITAL.)

**HODGKIN'S DISEASE.** (See BLOOD DISEASES.)

**HOOKEWORM DISEASE.** (See ANKYLOSTOMIASIS.)

**HYPERINSULINISM AND HYPOGLYCÆMIA.**

*Sir Walter Langdon-Brown, M.D., F.R.C.P.*

A. O. Whipple and V. K. Frantz,<sup>1</sup> in a full review of the whole subject of *spontaneous hyperinsulinism*, record 8 cases of *adenoma of the pancreas* found at operation which had been responsible for this condition. They call attention to a difference between the appearance of these growths and that of lymph nodes lying in the pancreas, in that the former are covered with a rich capillary network which the latter lack.

E. H. Ryncarson and F. P. Moersch<sup>2</sup> call attention to the universal occurrence of *neurological and psychic symptoms in severe hypoglycæmia* in the hope that with the co-operation of neurologists and psychiatrists many hitherto undiagnosed cases of hypoglycæmia may be discovered and, where due to an adenoma, treated surgically. They anticipate relief of otherwise unexplained nervous and mental symptoms in this way.

J. Penson and J. Wohl<sup>3</sup> find that *intravenous injections of insulin* not only produce a much sharper fall of blood-sugar than subcutaneous injections, as might be expected, but do not cause hypoglycæmic symptoms. The fall is followed by a fairly quick rise which they attribute to the defensive mechanisms being called into action to raise the blood-sugar level again. They therefore consider that the intravenous route should be restricted to the treatment of diabetic coma (even then only the first injection should be thus given) and that for ordinary purposes the subcutaneous method should always be used. They are of opinion that the level of hypoglycæmia at which symptoms occur is not fixed, but individual to each case.

It is difficult to see, however, considering how swift the onset of hypoglycæmic symptoms may be, why the great fall in blood-sugar they record after intravenous injection does not cause even momentary symptoms. Indeed, J. La Barre<sup>4</sup> describes cases of hypoglycæmia following intravenous insulin, thus differing from Penson and Wohl. He did so in the course of a discussion on hypoglycæmic states at the French Congress held at Quebec. The impression derived from that discussion is that a clearer conception of carbohydrate metabolism in general is being reached. R. Lemieux and S. Leblond<sup>5</sup> regard the blood-sugar level as the resultant of two great antagonistic systems—one tending to hypoglycæmia, the pancreas under the influence of the vagus, the other tending to hyperglycæmia, the adrenals, thyroid, and pituitary acting with the sympathetic, while mid-brain and bulbar centres regulate the whole. Spontaneous hypoglycæmia may therefore arise not merely from pancreatic tumours but also in cases of adrenal and pituitary disease, and may occur in certain cases of ovarian deficiency, scleroderma, cyclical vomiting, and infantile convulsions. In the same discussion Porot maintained that some cases of pituitary hypoglycæmia were mistaken for anorexia nervosa, which is rather difficult to understand since, as La Barre pointed out, insulin causes vigorous contractions of the stomach, and, as is well known, generally give rise to marked hunger. The influence of myrtillin and hepatic extracts in lowering blood-sugar was also alluded to, as was the effect of hepatic cirrhosis in causing a resistance to insulin. Roch and others described the production of hypoglycæmia by a large dose of hypertonic glucose intravenously which apparently strongly stimulated the internal secretion of the pancreas.

REFERENCES.—<sup>1</sup>*Ann. of Surg.* 1935, ci, June, 1299; <sup>2</sup>*Jour. Amer. Med. Assoc.* 1934, Oct. 20, 1196; <sup>3</sup>*Presse méd.* 1935, xliii, Jan. 12, 63; <sup>4</sup>*Ibid.* 1934, xlii, Oct. 10, 1581; <sup>5</sup>*Ibid.*

**HYPERPARATHYROIDISM.** (See PARATHYROID GLANDS; PARATHYROID SURGERY.)

**HYPERTENSION.***A. G. Gibson, M.D., F.R.C.P.*

In his Croonian Lectures for 1934, O. L. V. de Wesselow<sup>1</sup> surveys the whole question of hypertension, but only a few remarks can be made here. The lectures present a well-documented account of the subject as it is known at present. In speaking of *renal changes in essential hypertension* the author remarks that Weiss and Ellis found that of 17 hypertensive patients 13 showed a urea-clearance approximating to normal. It follows, therefore, that the renal function may be entirely intact and rules out the view that hypertension is a compensation for impaired renal efficiency. Clinical support is suggested in the predominance of cardiac failure and cerebral accidents as the cause of death and the relative infrequency of death from uræmia. In regard to the blood-pressure in nephritis he refers to its sudden elevation in acute glomerulonephritis and also to Koch's observations that about the fourteenth to the twentieth days in scarlet fever there may be transient rises of blood-pressure with the rare occurrence of casts in the urine. This rise in blood-pressure appears before any albuminuria, and albuminuria may be absent. The essential lesion in this rise in blood-pressure is supposed to be a capillaritis of the vessels of the glomerular tuft, and this has been confirmed experimentally in animals by the action of cantharides or mercuric chloride. In glomerulonephritis there is a second stage in which the blood-pressure may remain at a normal level though the lesion may be active and progressive. This is particularly noticeable in some of these patients who pass through a period with symptoms suggestive of nephrosis with heavy albuminuria and extreme oedema but without nitrogenous retention. In the third stage (when the kidney is beginning to fail) hypertension is almost invariable. The author confirms the presence of raised blood-pressure in polycystic disease, though not all cases show it. On the other hand, certain types of renal disease with a high degree of glomerular destruction and renal inadequacy do not show hypertension, such as in amyloid disease. In renal hypertension the author's view is that it is compensatory.

In the *hypertension due to paraganglioma* the symptoms are those typical of excessive adrenalin discharge. The patients suffer in the early stages from attacks that are acute and transient. They last from five to ten minutes and the blood-pressure may rise from normal limits to as much as 300 mm. systolic and 180 mm. diastolic. The pulse also is raised. There are painful cramps in the extremities, anginal pain, abdominal colic, dyspnoea, pallor, headache, and drenching sweat. There can be transient albuminuria after the attack, and with the rise of blood-pressure there may be a rise of blood-sugar and glycosuria. Retinal and cerebral hæmorrhage may occur and death may ensue from left ventricular failure.

In the *hypertension of hyperthyroidism* the author points out that the diastolic pressure is not raised to any extent and that the hypertension persists after successful thyroidectomy.

Another source of clinical hypertension may be *from the aorta*. Experimentally permanent elevation of the pressure may be produced by destruction of the aortic sinus (which in man includes the carotid sinus together with a vaso-sensitive zone stretching into the aorta) and also the sinus nerves. These so-called buffer nerves exercise a tonic inhibitory action on the centres of the medulla which are unrestrained after the destruction of the nerves. Post-mortem evidence does not appear to favour the attribution of hypertension to atheroma of the carotid sinus, nor does human experiment result, as yet, in any application of this knowledge to man.

J. Parkinson and C. Hoyle<sup>2</sup> have isolated a type of *hypertension among thyrotoxic patients* in whom the main symptoms are hyperthyroidism, though the fact of their being goitrous may have been overlooked by the small size

of the thyroid. They are usually women between the age of 45 and 65, thin, excitable, and easily tired. The tachycardia is moderate, between 90 and 110, and the systolic blood-pressure may be anything between 170 and 240 mm. of mercury, and the diastolic between 90 and 130 mm. Paroxysms of auricular fibrillation may be followed by permanent fibrillation. The thyroid is not necessarily enlarged and it may be substernal. Treatment by thyroid extract is contra-indicated and *subtotal thyroidectomy* will often relieve the symptoms.

J. T. King<sup>2</sup> finds that in cases of hypertension *throat infections* are frequent, and he discusses the etiological aspect of this factor. He cites a number of instances in which other workers have mentioned the same feature.

REFERENCES.—*Lancet*, 1934, ii, 579, 636, 687; <sup>2</sup>*Ibid.* ii, 913; <sup>3</sup>*Calif. and Western Med.* 1934, xii, 145.

## INCONTINENCE OF URINE. (See URETHRA, SURGERY OF.)

## INDUSTRIAL DISEASES. (See also POISONING; SILICOSIS.)

G. E. Oates, M.D., M.R.C.P., D.P.H.

**Silicosis.**—A useful memorandum<sup>1</sup> on this disease in its industrial aspects has been issued by the Home Office. Its incidence continues to be serious and widespread. During the three years 1932–4 the Silicosis Medical Board certified 1444 cases of disablement and 435 deaths from the condition. In the same period there were 60 cases of disablement and 5 deaths among workers in the asbestos industry. Silica is widely distributed in nature and occurs as the chief constituent of many rocks. Certain natural deposits of silica occur also as the remains of organic life, such as kieselguhr. All processes which involve the manipulation of any of these materials in the dry state in such a way that the silica is broken up into minute particles and inhaled are liable to give rise to silicosis. Chief amongst these are the mining, quarrying, drilling, blasting, breaking, crushing, or grinding of siliceous rocks. Amongst others may be mentioned processes in the pottery industry involving the use of powdered flint and the grinding of metals by means of sandstone.

### METHODS OF PREVENTION.—

1. *Suppression of Dust.*—This includes all measures which prevent the dust from being produced. It is sometimes successfully accomplished by the use of water, but to be effective the supply of water must be sufficient to keep all surfaces of the material wet during the whole process. In some cases, as in grinding of metals, effective dust suppression is only attained by the complete immersion of the metal being ground.

2. *Exhaust Ventilation.*—This is usually localized and applied at or as near as possible to the point of origin of the dust, and so arranged with reference to the air inlets and general ventilation of the room as to prevent the dust from entering the atmosphere of the work-place. When the dust is produced over a large surface, as in crushing machinery, it is necessary to enclose the machine as completely as possible and to apply an exhaust draught to the inside of the housing, sufficient to maintain a slight negative pressure and prevent escape of dust from apertures. Percussive drills worked by compressed air, which are largely used in mines and quarries and produce large quantities of fine dust, can now be provided with a 'dust trap' which gives the workmen efficient protection.

3. *Other Preventive Measures.*—A breathing apparatus consisting of a helmet or closely fitting face-piece provided with an air-supply drawn through a tube from a pure source affords protection for workmen employed in processes giving rise to dust, and is useful during short spells of dust production. Respirators can never be regarded as a substitute for exhaust ventilation, but for processes

which are outside the range of such ventilation an efficient respirator, with a filtering medium of fibre or tissue, is desirable. All dusty processes should be segregated, so as to protect workers employed in non-dusty processes from unnecessary exposure.

4. *Initial and Periodic Medical Examinations.*—The object of the initial examination required in certain scheduled industries is to prevent workmen whose respiratory physique is defective and who, if not more liable to contract silicosis, run much greater danger if it develops, from entering the industry. The periodic medical examinations carried out at the works enable the condition to be detected at an early stage, and if the workman is then excluded from, or voluntarily gives up, further employment in the dusty processes, the development of the disease may be arrested. They also enable persons found to be suffering from pulmonary tuberculosis, who not only expose themselves to additional risk by remaining in the dusty industries but are also a possible source of infection to their fellow-workers, to be eliminated. They also provide cumulative evidence as to the changes in the workman's condition which is of great assistance in diagnosis when the question arises of certification for purposes of compensation. Further, they indicate where the conditions are still giving rise to the disease, and may thus be of material assistance in enabling the necessary precautions to be taken.

Compensation in cases where death or disablement is caused by silicosis, or silicosis accompanied by tuberculosis, contracted during employment is now payable in all the industries where a serious risk of the disease exists. Any workman desiring to make a claim to compensation must have a certificate from the Medical Board appointed by the Home Office unless his employer agrees that he is liable to pay compensation without such a certificate. The Medical Board, with four panels of two Medical Officers each, has centres at Bristol, Manchester, Sheffield, and Stoke-on-Trent. There is no appeal from the Medical Board's decision, and hence it is important that all material information, and especially the employment history, should be given to the Board. The Board are required to issue a certificate whenever they find that a workman is suffering from silicosis, or from silicosis accompanied by tuberculosis, to such a degree as to make it dangerous for him to continue work in the industry or process concerned. In the case of death from silicosis compensation can only be claimed on a certificate given by the Medical Board, and a post-mortem examination is nearly always necessary.

**Asbestosis** resembles silicosis in its general features of causation and development, but differs from it in some of its clinical and pathological manifestations. The means of prevention, provision for compensation, and medical arrangements for examination and certification are similar to those which obtain in the case of silicosis.

**Poisoning from Metallic Fumes.**—It is now known that *metal-fume fever* or *brassfounders' ague* is caused by the breathing of the solid particles of zinc, magnesium, or copper oxides present in the fumes generated in the burning of these metals. A resistance to the fever may be acquired, but is not lasting, and corresponds to the leucocytosis which follows the fume inhalation. The fume fever does no lasting harm, the effects are not cumulative, and the metallic oxides causing it are not true industrial poisons. In recent years fume fever has been reported in the welders of galvanized iron, the causative agent being zinc oxide, which is formed when the zinc of the galvanized coating is boiled off by the welder's torch. A. C. Titus, H. Warren, and others<sup>2</sup>, have studied the industrial risks of electric welding. They are satisfied that the fumes of ferric oxide are comparatively harmless, but found that animals exposed to the vapour generated from the electric welding of steel developed

severe or fatal pulmonary oedema, which they ascribe to gases generated by the arc, such as nitrogen peroxide and ozone. They also describe a fatal case of oedema of the lung in an electric welder who worked in a confined space. The respiratory hazard in welding can be avoided by means which ensure the welder's breathing reasonably clean air. For this purpose the welder may wear a respirator or air mask, or the work-place may be ventilated. The efficacy of these measures may be assessed by examining the forced nasal discharges of the workers for the rusty brown colour of ferric oxide.

REFERENCES.—<sup>1</sup>*Memo. of Home Office*, 1935, Feb., "Silicosis and Asbestosis". H.M. Stationery Office; <sup>2</sup>*Jour. of Indust. Hyg.* 1935, xvii. No. 4, July, 121.

### INFANT FEEDING: DRIED MODIFIED MILK.

*Reginald Miller, M.D., F.R.C.P.*

When a dried-milk preparation is reconstituted with water in the proportion of 1 in 8 (1 drachm of milk powder in 1 oz. of water) we are back again at undiluted cow's milk. This constitutes one of the great advantages to be obtained from the use of dried whole-milk preparations. Protein digestion seems to be rendered more easy by the process of desiccation, and if some

#### COMPOSITION OF DRIED MODIFIED MILKS.

BRAND OF MILK	RECONSTITUTED BY ADDING 1 DRACHM OF POWDER TO 1 OUNCE OF WATER			REMARKS
	Protein	Fat	Carbo- hydrate	
Allenbury No. 1	1.2	2.3	7.9	Intended for infants of 1-3 months. Some casein has been removed, and vegetable albumin and lactose added
Allenbury No. 2	1.6	2.1	7.8	Intended for infants of 3-6 months. Similar to No. 1, but with addition of malted flour. Contains no starch
Almata	1.6	3.2	7.3	A much modified milk. The constituents of cow's milk are all present, with, in addition, egg-yolk, butter, malto-dextrins, mineral salts, and decitrated fruit juice
Ambrosia humanized	1.8	3.2	6.9	Contains added lactose
Cow & Gate $\frac{1}{2}$ cream	2.5	1.9	7.2	Contains added lactose
Dorsella humanized	1.5	3.2	6.9	
Glaxo Sunshine (sold at welfare centres as Ostermilk)	2.1	2.5	7.0	Contains added vitamin D. Each ounce of reconstituted milk is said to contain the equivalent of $2\frac{1}{2}$ drops of cod-liver oil
Lactogen	2.0	3.1	6.6	
Trufood humanized	1.4	3.4	6.25	Contains added cream and lactose. Casein 0.8 per cent. Lactalbumin 0.6 per cent

sugar is added the infant is taking a diet in which underfeeding is impossible. The average caloric value of full-cream dried milk is 18 calories to the ounce, the same as 1 oz. of fresh undiluted cow's milk. On the other hand, the strength of such feeds may be a disadvantage, more particularly in connection with their fat-content, which ranges from 3.2 to 3.6 per cent. W. Sheldon<sup>1</sup> states that in his experience these milks are too rich for young infants and can be more successfully used after about two months of age. [With this the reviewer cordially agrees, but would add that in the case of delicate or sick children even two months may be too young for a full-cream dried milk.—R. M.] Consequently there is a great scope for the use of dried *modified* milks, particularly where the percentage of fat in them has been reduced. Sheldon gives a useful list of these, which is reproduced on the page opposite.

REFERENCE.—<sup>1</sup>*Practitioner*, 1935, cxxxiv, 415.

### INFANTILE PARALYSIS. (See POLIOMYELITIS, ACUTE.)

### INFLUENZA.

J. D. Rolleston, M.D., F.R.C.P.

EPIDEMIOLOGY.—According to official information<sup>1</sup> on the recent prevalence of influenza in the United States and Europe the epidemic wave of the winter 1934-5 in the United States was greater than that of 1933-4 and 1931-2, but did not reach the level of that of 1932-3. The disease was four to five times more prevalent in January, 1935, than during the same month in 1931, 1932, and 1934, but was considerably less frequent than in 1933. The mild type of the epidemic was shown by the fact that the general mortality rates for 86 towns with a population of more than 100,000 were quite normal in December, the highest figure reached in these towns being in the week ending Jan. 16. Although as a general rule mild, influenza occurred in the greater part of Europe in the early months of 1935 in a definitely epidemic form. In Norway, Sweden, and Denmark, the disease reached its height in January or February, but only 17 deaths were reported among 8458 cases notified in Copenhagen during the first eleven weeks of the year. In Germany influenza was more severe, the number of deaths reported in the large towns being comparable to that reported in the winter of 1930-1 but lower than that during the epidemic of 1933. In Switzerland the epidemic spread very rapidly throughout the country, especially in the west, towards the end of January, but appeared to be much less fatal than the outbreaks of 1927 and 1931. In France influenza spread to all parts of the country in January and reached its maximum in Paris during the first ten days of February, when the general death-rate exceeded the average by nearly 27 per cent, a comparatively high death-rate occurring at the more advanced ages, as is characteristic of comparatively mild epidemics. In Roumania, Yugoslavia, and Czechoslovakia a mild type of influenza became widespread in January and February, while in Hungary an increase in the number of cases was not observed till March. In Spain influenza was prevalent in February, but did not reach serious epidemic proportions. In England and the Irish Free State the disease was quite mild. In Scotland the number of deaths attributable to influenza in the great towns reached 62, of which 45 were in Glasgow.

E. A. Underwood<sup>2</sup> deals with the epidemiology of an influenza outbreak which started in Leeds in November, 1932, and continued until the end of February, 1933. He found that factory workers were less liable to contract influenza than assistants in large shops, outdoor workers, clerks and office workers, and school teachers, and suggests that propaganda relating to respiratory infection may have been responsible for reducing the incidence of the disease among factory workers.

The Leeds outbreak took approximately twice as long to reach its peak as did the Glasgow epidemic, though both epidemics started almost simultaneously. As regards the age distribution of influenza deaths in Leeds since 1900, the 1918 epidemic produced an unprecedented toll of young adult life, and the return to the *status quo* was not sudden but was effected gradually over a period of about ten years. Investigation of the deaths in different parts of the city showed that there was no direct association between those deaths and the density of the population in the wards in which they occurred, nor any association between the number of influenza deaths and the average number of persons per room in each ward. Investigation of the meteorological conditions suggested that there was a direct relationship between a fall of temperature, especially if accompanied by fog, and an increase in the incidence of influenza and pneumonia. The disease was essentially of the respiratory type, and the gastric type was not common. Complications were not frequent, the commonest being pneumonia and otitis. The duration of incapacity for work varied from about nine days in the case of brain workers and persons in the middle classes to a fortnight or three weeks in artisans and factory workers. Although the outbreak was mild, infection was widespread, and the total incapacity must have resulted in a considerable economic loss to the community.

**BACTERIOLOGY.**—C. H. Andrewes, P. P. Laidlaw, and W. Smith,<sup>3</sup> who had previously infected ferrets with a virus isolated from human cases of influenza and also with a strain of swine influenza virus (*see* MEDICAL ANNUAL, 1934, p. 233), have recently come to the conclusion that mice are susceptible to the viruses of human and swine influenza on the following grounds: (1) Virus of ferret origin regularly produces in mice pulmonary lesions resembling some of those found in influenzal lesions in men; (2) After several passages through mice the virus still produces the characteristic lesions in the ferret; (3) Cultures of the lungs of infected mice on ordinary media are often sterile, and do not in any way tend to yield growths of any particular organism; (4) Filtrates of infected mouse lungs through membranes are infectious for other mice; (5) The two viruses when isolated from mice are neutralized by the corresponding sera prepared from other animals.

A. Eichhorn and N. J. Pyle,<sup>4</sup> who confirmed the findings of Andrewes, Smith, and Laidlaw regarding the inoculation of ferrets and the post-mortem changes in these animals, found that inoculation of the human influenza virus induced immunity in ferrets to the virus of canine distemper. There thus appears to be a possible relationship between influenza in man and the distemper virus in dogs. The writers are conducting experiments to determine the possibility of cross-immunization with the virus of influenza and the virus of canine distemper.

**SYMPTOMS AND COMPLICATIONS.**—E. Appelbaum<sup>5</sup> records a case of *recovery from influenzal meningitis* in a man aged 47, which is of interest not only on account of the rarity of recovery from this condition, but also because the meningitis was complicated by diabetes mellitus, pachymeningeal hemorrhage, and spinal arachnoid block. Treatment consisted in intravenous and intrathecal injection of anti-influenzal serum and repeated spinal drainage.

J. W. Williams,<sup>6</sup> who records an illustrative case, states that while influenzal meningitis is comparatively frequent in children, *influenzal peritonitis*, of which examples were reported by Isnard in 1892 and Hill and Fisch in 1903, is either infrequent or has received little attention. Williams's case is that of a female infant, who developed symptoms of meningitis on the fourth day of life, and died on the nineteenth day. A cloudy spinal fluid was removed



by lumbar puncture and showed *B. influenzae*. In addition to meningitis, malignant necrosis and small hæmorrhages in the brain, the necropsy showed a mild degree of peritoneal involvement in the form of flakes in which *B. influenzae* was found on the surface of the liver, spleen, parietal peritoneum, mesentery, and intestines. The case was unique in that the child was taken ill on the fourth day of life. No cultures of the parents' nose or throat were taken.

G. Andrieu, P. Guichéré, and J. Parisot<sup>7</sup> state that *orchi-epididymitis*, of which they report a case in a man aged 24, is a very rare complication of influenza. It may be primary and occur within the first fortnight of the disease, in which case it is always mild, the epididymis being chiefly attacked, or secondary, the organisms of secondary infection reaching the testis by the vas deferens or blood. In the authors' case right orchi-epididymitis developed on the twenty-second day of influenza. Seropurulent fluid, from which hæmolytic streptococci were cultivated, was removed from the tunica vaginalis. Recovery followed injection of 10 c.c. of antistreptococcal serum and 4 c.c. of 1 per cent solution of collargol. When the patient was seen six months later the right testis was atrophied and insensitive and the ectopic left testis was double its previous size and normally sensitive.

REFERENCES.—<sup>1</sup>*Epid. Rep. Health Sect. League of Nat.* 1935, xiv, 7; <sup>2</sup>*Jour. of Hyg.* 1934, xxxiv, 407; <sup>3</sup>*Lancet*, 1934, ii, 839; <sup>4</sup>*Jour. Amer. Med. Assoc.* 1934, cii, 2082; <sup>5</sup>*N.Y. State Jour. Med.* 1935, xxxv, 215; <sup>6</sup>*Amer. Jour. Dis. Child.* 1934, xlviii, 840; <sup>7</sup>*Bull. Soc. méd. Hôp. de Paris*, 1934, i, 1407.

## INTESTINAL OBSTRUCTION.

A. Rendle Short, M.D., F.R.C.S.

**Mortality.**—When Haden and Orr demonstrated in 1923 the sodium chloride deficiency in the blood in dogs with artificial intestinal obstruction it seemed that a new era in treatment might be ushered in, and ever since that time everyone has been giving quantities of hypertonic saline intravenously as a pre-operative measure. F. H. Amendola,<sup>1</sup> of New York, finds that in his hospital this has not led to any reduction of the mortality, though no doubt it is treatment on the right lines. So often there is strangulation of bowel present, or bowel that is deprived of a large part of its blood-supply by distension and stretching, and any long delay in order to administer salines will allow the bowel wall to become pervious to germs, and to become so stretched that it cannot recover function. The real indication for delay, with intravenous saline and gastric or duodenal drainage by an indwelling tube passed through the nose, is in cases of plastic peritonitis causing obstruction symptoms. Although statistics do not show it, the author believes that resection and exteriorization of both ends in double-barrelled fashion, like the Paul-Mikulicz operation, is safer than end-to-end anastomosis, or the gangrenous loop may be brought outside, and a tube tied in the proximal end.

K. A. Meyer and J. L. Spivach,<sup>2</sup> of Chicago, also report that the mortality has not varied much in the last twenty-five years; in 505 cases it was 48.6 per cent. They do not expect much improvement from pre-operative treatments; early and ever earlier operation is the key to success. Plain X rays, without barium, are of real value in early diagnosis, showing up the distended coils. W. Moss and E. M. McFetridge,<sup>3</sup> of Louisiana, on the other hand, report a fall in the death-rate from 70.7 per cent in 1923-7 to 31.7 per cent in 1930, and believe that the newer methods, such as pre-operative intravenous saline, spinal anæsthesia, less ambitious operations, and X-ray diagnosis, have helped, as well as getting cases earlier. [A mortality of 70 per cent was, of course, far too high. In this country, there has been a fall in the mortality, as the B.M.A. statistical investigations show, but probably not recently.—A. R. S.]

Amos Eby and W. R. Robbins,<sup>1</sup> of Chicago, reviewing 241 cases, with a mortality of 42.7 per cent, note that there has been no great reduction in ten years. Enterostomy, and the double-barrelled fistula, both carry a high death-rate, partly due, of course, to their employment in the most desperate cases, but closure is apt to be difficult and dangerous. They believe that enterostomy proximal to the resection of an area of obstructed and damaged gut will be of great value.

**Fatal Toxæmia due to Deflation.**—R. Elman,<sup>5</sup> of St. Louis, relates 5 cases in which operative relief of obstruction due to adhesions was followed a few hours later by fatal collapse, sometimes with fever and delirium. He agrees with Sir William Wheeler and others in believing that deflating the dilated intestine has been the effective cause of death. When on account of distension the lining epithelium of the bowel has become necrotic, and bacteria and toxins have invaded the bowel wall, the ischæmia protects against much general absorption, but with deflation the circulation recovers, and the veins carry away a fatal dose of toxin. Remedies might be either to carry out an extensive resection well above the distended area (though it is difficult to know how far up to go), or perhaps a more gradual deflation.

**Enterostomy.**—A technique, which the reviewer has followed for years and can recommend, is described by R. R. Linton.<sup>6</sup> It is made sufficiently clear by the figures and their legends (*Plates XXXVII-XXXIX*).

**Intussusception after Gastro-enterostomy.**—A. W. Adams,<sup>7</sup> and also R. K. Debenham,<sup>8</sup> describe cases of acute obstruction due to retrograde intussusception of the jejunum through a gastrojejunostomy. Adams says the condition can be diagnosed when a patient with symptoms of acute obstruction presents (1) an epigastric scar, (2) visible peristalsis from left to right, with (3) a palpable mobile swelling about the mid-abdomen. Both cases were saved by immediate operation. A few stitches may be inserted to fix the reduced segment to the afferent jejunal loop to avoid recurrence.

**Intestinal Obstruction from Localized Hypertrophic Enteritis.**—W. A. Jackman<sup>9</sup> describes two such cases, both located in the terminal ileum, in women under forty. Both were saved by resection. The condition is shown in *Plates XL and XLI*.

**Volvulus.**—Volvulus of the sigmoid, relatively uncommon in this country, is next to strangulated external hernia the most frequent cause of intestinal obstruction in Poland, being favoured by the diet of the people, which is principally composed of bread and vegetables. It is commonest in men in the fifth decade. [In Great Britain the age is higher.—A. R. S.] Recurrence is very common. The significant signs are vast abdominal distension, usually asymmetrical, and after abdominal percussion the loop can often be seen filling and emptying, provided that necrosis has not yet taken place. Occasionally the condition can be relieved by rectal flushings and hot baths, or a catheter may be passed per rectum into the loop to drain it; this device, however, sometimes leads to perforation.

In ordinary, early operation is best. If the loop can be reduced, L. Achmatowicz,<sup>10</sup> of Vilno, empties it by a large rubber tube inserted through the rectum. If the loop is necrotic, he exteriorizes it and reduces intra-abdominal manipulation to the absolute minimum.

REFERENCES.—<sup>1</sup>*Ann. of Surg.* 1935, May, 1250; <sup>2</sup>*Ibid.* 1934, July, 148; <sup>3</sup>*Ibid.* 158; <sup>4</sup>*Surg. Gynecol. and Obst.* 1935, March, 738; <sup>5</sup>*Amer. Jour. Surg.* 1934, Dec., 438; <sup>6</sup>*Ibid.* July, 55; <sup>7</sup>*Brit. Med. Jour.* 1935, i, 248; <sup>8</sup>*Ibid.* 250; <sup>9</sup>*Brit. Jour. Surg.* 1934, July, 27; <sup>10</sup>*Bull. et Mém. Soc. de Chir.* 1934, xxvi, 372.

# PLATE XXXVII

## ENTEROSTOMY

(R. R. LINTON)

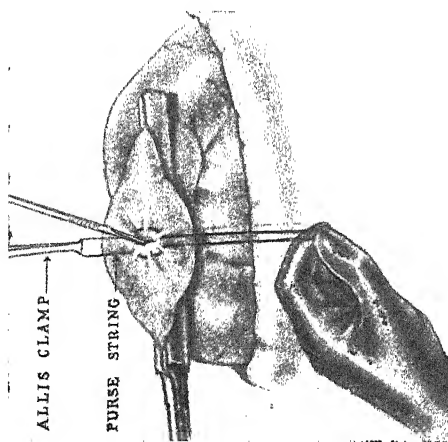


Fig. 4.—Richardson's method. Opening of intestine after applying an intestinal clamp and inserting a purse-string suture. Note that segment of bowel within clamp is collapsed, fecal material having been milked out before applying instrument. Use of clamp in this manner cannot be over-emphasized as it prevents any spilling of highly infective fecal material. Tension maintained on purse-string, as shown, facilitates opening of bowel. A short transverse incision as shown is most satisfactory.

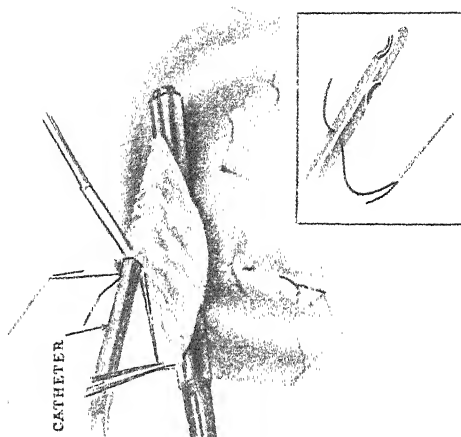
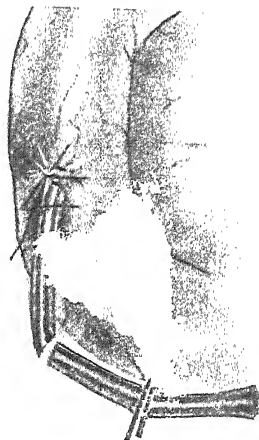


Fig. 5.—Richardson's method. Drainage catheter is inserted with intestinal clamp still in place. Then purse-string is tied snugly about catheter. Inset shows method of preparing catheter before inserting it into bowel. Note that there are *two apertures* in it (a very important point) and that *stitch goes through wall but not lumen of tube*. Suture material in this illustration and in Figs. C and D is fine silk threaded on a straight intestinal needle. '00' chromic catgut on an atraumatic or non-traumatizing needle is even preferable to fine silk.

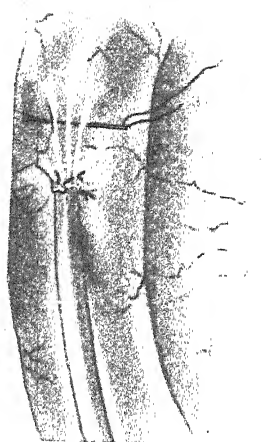
# PLATE XXXVIII

## ENTEROSTOMY—continued

(R. R. LANTON)



*Fig. D.*—Richardson's method. Beginning of sutures to bury tube in intestinal wall. Picking bowel up at three points closes this end of trough more effectively than if only two points are picked up.



*Fig. E.*—Richardson's method. Manner of anchoring tube. This last step is very important as it prevents slipping out of intestine for at least several days.

# PLATE XXXIX

## ENTEROSTOMY—continued

(R. R. LINTON)



Fig. B.—Richardson's method. Completion of burying row of continuous Lembert sutures. Suture shown is tied at next stitch. Note only a slight narrowing of the intestine opposite suture line.

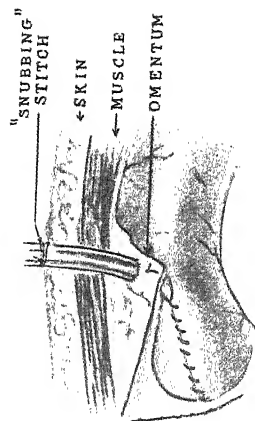


Fig. F.—Richardson's method. Omentum fastened around drainage tube and covering suture line, tube passing out through abdominal wall, and silk stitch anchoring tube to skin edge.

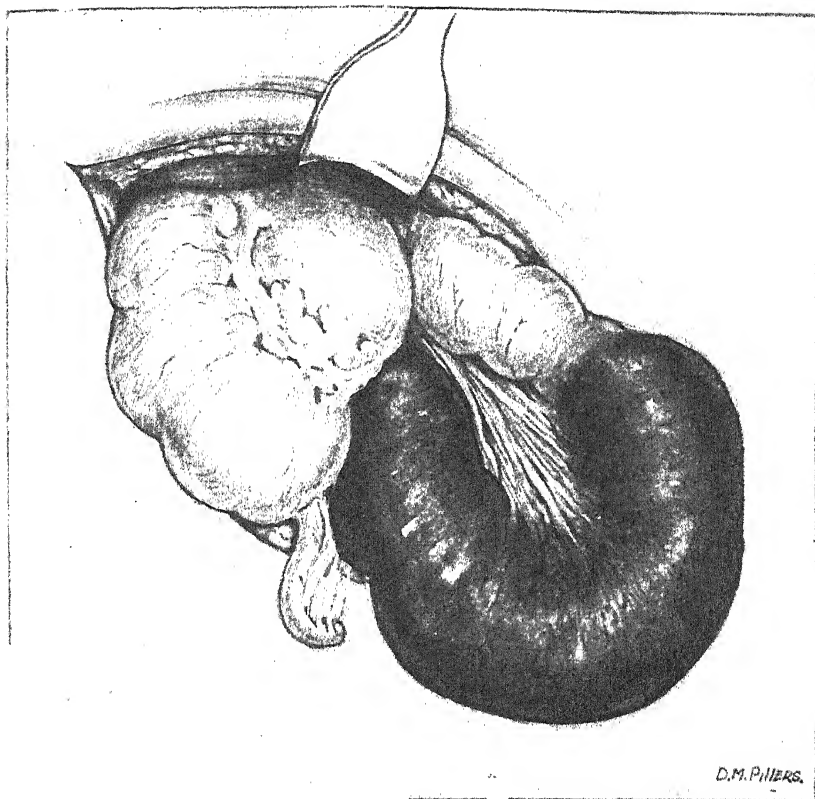
Plates XXXVII—XXXIX by kind permission of the 'American Journal of Surgery'



# PLATE XL

## LOCALIZED HYPERTROPHIC ENTERITIS

(W. A. JACKMAN)



NOT A  
LOCAL

Not a  
local

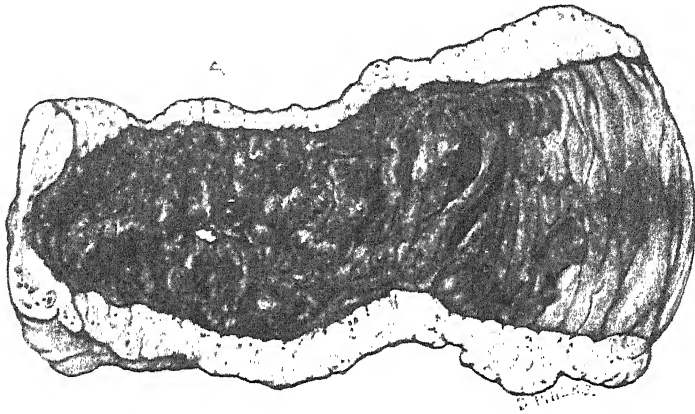
commencement and termination

"Plates XL and XLI by kind permission of the 'British Journal of Surgery'"

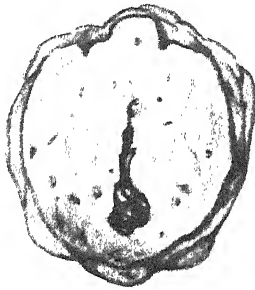
PLATE XLI

LOCALIZED HYPERTROPHIC ENTERITIS—*continued*

(W. A. JACKMAN)



*Fig. B.*—Portion of ileum removed, opened by longitudinal incision, showing the intense congestion of the mucous surface, and extreme fibrous thickening of the intestinal wall. Note extensive necrosis of small area and perforation (A).



*Fig. C.*—Transverse section to show thickened wall of ileum and obliteration of lumen.



**INTESTINES, SURGERY OF.**

A. Rendle Short, M.D., F.R.C.S.

**Swallowed Foreign Bodies.**—Chevalier Jackson and C. J. Jackson<sup>1</sup> lay down as a working rule that when these are lodged in the intestine daily examinations should be made by radiography, and if the foreign body remains in the same place for a week it should be removed. Arrest of long or sharp objects in the duodenum of children is particularly dangerous.

A. Rendle Short<sup>2</sup> relates two cases of a swallowed Kirby grip (hair-slide) arrested in the duodenum. It is best to extract these by opening the stomach and passing a forceps through the pylorus.

**Meckel's Diverticulum.**—Two papers on this subject may be referred to, by C. E. Farr and M. Penke,<sup>3</sup> of New York, and by D. P. MacGuire,<sup>4</sup> of Columbia University. It is generally recognized that the diverticulum can give rise to trouble in three ways: (1) *Acute diverticulitis*, with symptoms like appendicitis but more central; (2) *Acute intestinal obstruction*, by strangulation; and (3) *Intussusception* into the ileum, with the usual symptoms of intussusception. To these Farr and Penke add a fourth, (4) *Recurrent melena*. This may be quite severe. They relate two cases in children both cured by excision of the diverticulum. This is a condition which may be well borne in mind, as recurrent melena in children is apt to go undiagnosed. MacGuire advises that when the whole diverticulum is acutely inflamed, it should be brought outside and removed and the two loops of ileum drained as in the Paul-Mikulicz operation. If only the distal portion is inflamed it is bad practice to amputate it at its base as one amputates an appendix. The surgeon either removes too much and narrows the ileum, or too little and leaves a pouch to give further trouble. A diamond-shaped piece of ileal wall should be excised to include the base of the diverticulum, and the gap sewn up transversely to the ileum.

**Leiomyoma.**—Another possible cause of obscure melena in adults is leiomyoma, which may become malignant (E. J. Klopp and B. L. Crawford<sup>5</sup>).

**Ileo-sigmoidostomy.**—V. Delagenière,<sup>6</sup> of Mans, has devised a button-sound to make this anastomosis which does away with the necessity for any suturing. The method of use is shown in Fig. 37.

REFERENCES.—<sup>1</sup>*Med. Record*, 1934, Sept., 285; <sup>2</sup>*Brit. Med. Jour.* 1934, ii, 965; <sup>3</sup>*Ann. of Surg.* 1935, April, 1026; <sup>4</sup>*Brit. Med. Jour.* 1935, i, 1167; <sup>5</sup>*Ann. of Surg.* 1935, Feb., 726; <sup>6</sup>*Bull. et. Mém. Soc. nat. de Chir.* 1935, March, 372.

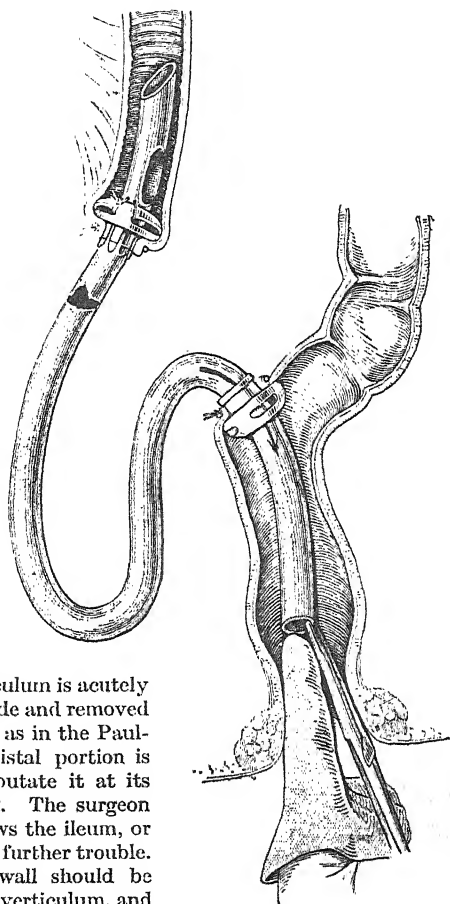


Fig. 37.—Delagenière's button-sound for use in ileo-sigmoidostomy. [(By kind permission of 'Bulletins et Mémoires de la Société nationale de Chirurgie'.)]

**INTRACRANIAL TUMOURS.** (*See also* BRAIN; METASTATIC TUMOURS OF;  
X-RAY DIAGNOSIS.) *Geoffrey Jefferson, M.S., F.R.C.S.***PITUITARY TUMOURS.**

J. M. Meredith<sup>1</sup> discusses the selection of pituitary tumours for operation, remarking on the differences of opinion that have been expressed as to whether they should be operated upon or treated by Röntgen therapy. The French radiologists have been strong supporters of the latter view. H. Cushing<sup>2</sup> originally stated that *X-ray treatment* in some cases had a notable effect on these tumours, but twenty years later had revised his opinion and believed it was very doubtful whether it had any effect whatever on the chromophobe adenomata. Occasionally aggravation of symptoms from swelling of the tumour follows radiation and an urgent operation may be called for. One must, of course, have a definite standard by which one may judge what effect any treatment is having. The standard in the pituitary adenomata is the visual fields; unless the fields show improvement the treatment cannot be said to be having a beneficial effect, for the only effect worth having is a shrinkage of the tumour, taking the pressure off the optic chiasma. The patient might feel better generally and might perhaps have less headache, if that is the feature of the case (but many patients with pituitary tumours have little or no headache), but this could not be counted an important gain unless repeated perimetric examinations showed that the fields were enlarging. Better still, there should be an increase in acuity. Frazier has stressed the importance of the appearance of the optic nerve-heads as a factor in the decision how a case should be treated. If optic atrophy is advanced, one eye perhaps nearly blind, and vision in the other eye failing, it has been the general experience that X-ray therapy does not help. In 1926 E. B. Towne<sup>3</sup> discussed this same problem and concluded that all adenomata should be treated by X rays. However, the experience at that date was that 20 per cent of adenomata were cystic, and X rays have no effect on these. Towne later on had to report recurrence after Röntgen therapy, and three of his small group came subsequently to operation. C. Hare and C. Dyke<sup>4</sup> in 1933 reported a series of 20 cases of their own in which headache and drowsiness were partially or completely relieved in 75 per cent of patients. Menstrual disturbances were often favourably influenced. On the other hand, vision was improved in only 25 per cent. This, as Meredith points out, is really the crux of the problem, for although it is satisfactory that endocrine disturbances can be improved or rectified by irradiation, the thing that really matters is vision, and if only one in four is benefited in this respect the treatment is clearly defective. Of Hare and Dyke's cases only 5 per cent had a return of vision to full normal, whilst 25 per cent underwent a further diminution of acuity after X-ray treatment. Almost all workers are agreed that the chromophil (acromegalic) adenomata are more sensitive to radiation than the commoner non-toxic, chromophobe type. Meredith reports an acromegalic who had forty X-ray treatments, at the end of which vision was reduced to 20/100. Sixteen days after operation vision was 20/30. The tumour was solid.

One may conclude by saying that X-ray therapy may be justifiably tried in those cases in which vision is so far only slightly affected, but the patient will be fortunate if he or she does not eventually come to operation, for there are very few cases indeed on record in which the patient was well five years after Röntgen therapy alone. When vision is already seriously defective and the fields show clear-cut defects, Röntgen therapy may prove only a dangerous waste of time. It must be recalled that many acromegalics have no visual

defects, and X-radiation is certainly then a permissible treatment, but it is very rare to see recognizable improvements in the somatic changes which characterize this disease, though headache may be improved, and occasionally, as has been stated, there may be endocrine re-activations. On the whole, the present-day trend is towards early operation, reserving X-ray therapy as a valued post-operative weapon. The mortality of operation is now so low, about 5 per cent, that no one need fear it. Indeed, given a reasonably small tumour, the mortality should be still lower, the fatalities occurring amongst those with large suprasellar extensions rising to the hypothalamic region.

In conclusion, and at the risk of reiteration, an important clinical point must be emphasized, that whereas acromegaly as a rule carries the diagnosis plainly stamped upon the patient, the non-toxic tumour of the pituitary commonly causes little or no alteration in appearance, and the tumour makes its presence felt only by failure of vision. It is a strange fact that a toxic tumour may exist for years and produce a chronic acromegalic state and great enlargement of the sella turcica and yet never rise sufficiently far out of it to compress the optic chiasma. Whether or not such a patient has X-ray therapy is a matter of individual choice. As has been stated, no great alteration occurs as a result except possible relief of certain symptoms. The greater number of chronic acromegalics go through life without requiring any special treatment and may live to old age fairly happily. The problem with the other (non-toxic) type of tumour is always much more urgent, and must be wisely and decisively handled.

It goes almost without saying that the same thing applies to the acromegalic who has chiasmal compression. There is no way of knowing beforehand whether the tumour will or will not react to X-ray therapy, nor of knowing whether the effect will be good or bad. It is likely to be called for amongst better-class people, who notice changes in their vision and seek advice from an authoritative source at an earlier date than does the hospital class, who often have surprisingly severe defects when they present themselves for the first time.

#### CEREBRAL TUMOURS AND EPILEPSY: MENINGIOMAS.

That a patient suffering from epilepsy may have an intracranial tumour is an established fact, though the relationship is not quite so widely known as that between trauma and convulsions. Indeed, the acceptance of the fact without further elaboration is fraught with some danger if the clinician thinks that the tumour cases will be always easily distinguishable for what they are. Some patients with tumours have generalized fits long before signs of compression or localizing signs appear, nor are there always special characters in the pattern of the fit to denote that a tumour has caused it. When the seizures are Jacksonian in type the possibility of tumour as a cause is more apparent, and certain tumours produce this sort of convulsion more often than others. Chief of these are the meningiomas. The most common sites for the growth of one of these well-circumscribed and generally benign tumours of the meninges is along a line on either side of the superior longitudinal sinus. When such a tumour is situated opposite the fissure of Rolando it is apt to stimulate the upper end of the motor cortex and therefore to produce epileptic attacks in the leg. The mechanism of stimulation is probably a local ischaemia, and since the tumour compresses the cortex increasingly as it grows the epileptic attacks are commonly accompanied by a progressive weakness of the contralateral lower limb. If the tumour is post-Rolandic in situation, sensory epilepsy may occur, but if it is elsewhere along the length of the

sagittal sinus the attacks may lose their focal character and be generalized. Often enough the meningiomata cause hyperostosis in the bone overlying them, and the clinical picture is then classical and easily recognizable, both the nature and the situation of the tumour being certain.

In a recent paper R. A. Groff<sup>5</sup> analyses Cushing's series of 291 cases of verified meningioma in order to determine the incidence and character of the epileptic attacks produced by these lesions: 31 per cent of the patients had epileptic seizures, which is, Groff remarks, practically the same as that given for the incidence of epilepsy in patients with all types of brain tumour. Sargent's figure was identical in a series of 270 tumours of various types. Of the 90 tumour epileptics reviewed by Groff, 65 had Jacksonian seizures, 18 had generalized epilepsy, and 7 petit mal. The tumours which arose opposite to the motor cortex were those most frequently associated with epilepsy. There were 17 growths in that area and 15 had convulsions. The incidence was only slightly less when the tumour arose in the area close behind the fissure of Rolando, for of 34 patients with tumours there 26 had attacks. The incidence was lower in the frontal region, for of 40 patients only 15 had attacks. To turn first to the 18 patients with generalized convulsions, there was no aura in 10, and the convulsion which followed was indistinguishable from a generalized idiopathic epileptic seizure. The attacks, however, were rare, half the patients having six attacks or less, whilst the other half had from twelve to twenty-four or more. The greatest length of time during which a patient suffered from convulsions and was proved later to have a meningioma was seventeen years, and the shortest three weeks. In most cases the patient's history of convulsions covered a period of from six months to three years, and generally a convulsion was the initial symptom. Pressure phenomena appeared at a later date. Amongst the Jacksonian epileptics the pure sensory attack was the rarest. The focal attacks tended to be far more frequent than the generalized ones, the majority having had over 25 attacks, and once again these attacks put in an appearance before there was any further evidence of tumour. The parasagittal meningiomas might be expected to produce epilepsy most often in the leg, but actually occurred in the leg in 9 cases, in the arm in 9 cases, and in the face in 1 case. Following on the removal of the tumour in the 66 patients who survived operation, 24 were completely relieved of the seizures, and the remaining 42 continued with attacks much as before, and the nature was approximately the same as pre-operatively.

Groff also discusses the question of uncinat fits occurring with meningiomas occupying the Sylvian fissure, mostly springing from the dura covering the sphenoidal ridge. There were 12 such patients, and in 7 instances the attacks were relieved by the tumour removal.

REFERENCES.—<sup>1</sup>*Ann. of Surg.* 1935, Jan., 228; <sup>2</sup>*The Pituitary Body*, 1912; <sup>3</sup>*Ann. of Surg.* 1930, xci, 29; <sup>4</sup>*Arch. of Ophthalmol.* 1933, x, 220; <sup>5</sup>*Ann. of Surg.* 1935, ci, 167.

## INTRATHORACIC MALIGNANT TUMOURS. (*See also* LUNG, CARCINOMA OF.) *A. Tudor Edwards, M.Ch., F.R.C.S.*

**Irradiation Treatment.**—The treatment of malignant growths in the chest by irradiation has given rise to a good deal of controversy. This is partially due to the obvious difficulty in a certain proportion of cases in determining whether the lesion is primarily pulmonary or primarily mediastinal. In the mediastinal group, such as lymphadenoma or lymphosarcoma, the value of X-irradiation is unchallenged, although it is often only temporary; whereas in the pulmonary cancers, the curative value of this treatment is denied, and even the symptomatic relief debatable.

F. G. Chandler, N. S. Finzi, and J. Maxwell<sup>1</sup> record results in 70 cases: (1) 56 were bronchial carcinomata—44 treated by X-radiation and 12 by radium emanation. (2) 9 were malignant tumours other than bronchial carcinoma, consisting of 2 primary in the chest, 5 secondary carcinomas, and 2 secondary sarcomas, all treated by X-radiation; and (3) 5 tumours of doubtful nature likewise treated by X-radiation. In each of the cases treated by X rays at least ten applications were given. In a great number of other cases treatment was abandoned in the early stages of the course, and these have been excluded from the series. The authors divide the bronchial carcinoma cases treated by X rays into three groups:—

1. Cases which showed great improvement, numbering 23. In 10 relief of pressure symptoms was rapid, in 11 gradual, and in the remaining 2 the shadow in the X-ray film disappeared with little or no improvement in the patient. Of the eventual outcome, 18 patients have died at an average duration of life from commencing treatment of 9·7 months. Five were alive at the publication of the report at intervals from five to thirty-two months after treatment.

2. Cases which showed slight improvement. In this group of 7 cases there was incomplete but definite relief of symptoms with an average duration of life of 8·6 months. As regards these two groups, the remark is made that "great symptomatic improvement or disappearance of the shadow in the skiagram does not necessarily indicate prolongation of life". The results quoted in 12 cases treated by radium emanation were definitely discouraging either as to dosage or to frequency of irradiation.

3. Cases which did not respond to treatment. In 14 cases there was no change in the condition of the patient after a course of treatment. In 2, the date of death could not be ascertained; the average duration of life in the remainder was 5·4 months.

The conclusions arrived at by these observers from this series are that the results of X-ray treatment have improved very greatly. They have quoted many cases of relief or complete disappearance of symptoms, and some where the malignant mass has entirely disappeared. In no cases of bronchial carcinoma has this been complete and lasting cure. They finally state: "In view of these conclusions we shall often be exercised, in making a decision, whether to advise this treatment to an individual patient or not. Relief of pressure symptoms can be expected in a certain proportion of cases, and if these are severe and distressing we can hardly deny the treatment if it is available. In other cases, in view of the unavoidable expense of treatment or the inconvenience caused by moving the patient to an institution, the impossibility of guaranteeing a result, and the severe reaction that may be suffered during or shortly after the cessation of treatment, we may find it difficult to make up our minds."

**Total Pneumonectomy.**—W. F. Rienhoff and E. N. Broyles<sup>2</sup> record two cases in which total pneumonectomy was performed for growths involving the left main bronchus. In the first case, a girl of 3 years, the whole left bronchial tree was filled with a tumour mass, which was originally diagnosed from bronchoscopic biopsy as a spindle-celled fibrosarcoma. The operation was successful, and the final pathological diagnosis stated the tumour to be an intrabronchial fibropapilloma. This patient had survived operation over fifteen months at the date of the report.

The second patient was a woman of 24 years who was found by bronchoscopy to have a tumour about an inch below the first branch in the left bronchus. Bronchoscopic removal was unsuccessfully attempted and X-radiation without effect, the pathological diagnosis being carcinoma. A total pneumonectomy

was carried out as successfully as in the first case, and there had been no recurrence of symptoms ten months later.

These cases illustrate the fact that total removal of a lung for malignant disease is not only possible but will become increasingly practised in the future. Several further cases are steadily accumulating in the literature, and improvement in technique is rapid. It will, however, be noted that both these patients were young.

REFERENCES.—<sup>1</sup>*Brit. Med. Jour.* 1934, ii, Oct. 20, 714; <sup>2</sup>*Jour. Amer. Med. Assoc.* 1934, Oct. 13, 1120.

### INTUSSUSCEPTION. (See INTESTINAL OBSTRUCTION.)

### JAUNDICE. (See also BLOOD DISEASES.)

#### JAUNDICE, INFECTIVE.

J. D. Rolleston, M.D., F.R.C.P.

EPIDEMIOLOGY.—The following account is given of the incidence of Weil's disease in different countries by their delegates at the International Office of Public Health. Reiter,<sup>1</sup> the German delegate, said it was impossible to supply exact statistics as the disease was not notifiable in his country, where only sporadic cases had been occasionally reported. According to H. S. Cumming,<sup>2</sup> most of the American observers believed that there were two forms of infective jaundice, one due to *Leptospira icterohæmorrhagica*, while the other disease or group of diseases was due to some other organism. From 1812 to 1886, 11 epidemics of infective jaundice had been reported in the United States, and between 1886 and 1920 another 51, exclusive of the cases in the Hispano-American and World Wars. Both in the United States and in Latin America, where epidemics had occurred in recent years, the mortality of the disease was low except in puerperal cases. B. Erber,<sup>3</sup> the French delegate, showed that during the period 1923-32 there had been a fairly steady increase in spirochætal jaundice in Paris and the Departments without any actual epidemics having occurred. M. Tsurumi,<sup>4</sup> the Japanese delegate, stated that Weil's disease was almost ubiquitous in Japan, where it was notifiable in most of the prefectures, and destruction of rats and prophylactic inoculation were carried out. In 1933 the total number of cases in Japan was 1636, with a fatality rate of 4.6 per cent, but in one prefecture during the last six years this rate had ranged from 16 to 20.9 per cent. G. Olin,<sup>5</sup> of Stockholm, said that the disease was almost unknown in Scandinavia, where only 6 cases with 3 deaths had occurred during the last year. According to N. M. J. Jitta,<sup>6</sup> a decline in the incidence of Weil's disease in Holland took place in 1934 owing to the following causes. The summer of 1934 was less hot than those of previous years, with the result that there was less bathing, which was a frequent source of infection. Secondly, the destruction of rats had been carried out more vigorously than in previous years. The first case of Weil's disease to be reported in the Argentine Republic is that recorded by H. Barros,<sup>7</sup> in a woman aged 22 after bathing in a public bath at Buenos Aires. The diagnosis was confirmed by the agglutination test. Death took place after four and a half months' illness.

An outbreak of 40 cases of infective jaundice with 3 deaths, which occurred among the sugar-cane workers at Ingham, North Queensland, from July to October, 1933, is reported by J. H. L. Cumston.<sup>8</sup> The symptoms and post-mortem lesions suggested Weil's disease, but examination of the blood and urine as well as of the local rodents was negative. No more cases occurred between November, 1933, and June, 1934, but another epidemic of about 130 cases with 4 deaths took place between July and August, 1934. The first bacteriological examinations were negative, but subsequently leptospiræ were found in guinea-pigs inoculated with the patient's blood and urine and in the

kidneys of rats from different localities in the district. Active measures were taken to destroy the rats, which were very numerous in the sugar-cane fields, and the disease was made notifiable. Further descriptions of the Queensland epidemic are given by G. C. Morrissey,<sup>9</sup> and J. P. Cotter, and W. C. Sawers.<sup>10</sup>

Further examples of spirochaetal jaundice in London sewer workers, to which reference was made in the last issue (*see* MEDICAL ANNUAL, 1935, p. 207), are described by E. A. M. Halsted<sup>11</sup> and J. M. Alston.<sup>12</sup>

H. H. Bashford<sup>13</sup> reports an outbreak of 48 cases of epidemic catarrhal jaundice which occurred in the Central Departments of the General Post Office, London. The workers in only four rooms were affected, although there were many other rooms in the same building whose occupants would meet them in the affected rooms, nor did any of the sufferers carry the disease to their home circles. All made a good recovery after mild attacks. No evidence of leptospiral or paratyphoid infection was found in the urine, faeces, or blood, and Schüffner's test for agglutination of *L. icterohaemorrhagiae* and *L. canicola* was negative.

J. Wolstencraft<sup>14</sup> records a case of Weil's disease in a man aged 28, living in the village of Boxmon, Herts., who had been working in a canal infested by rats. The diagnosis was confirmed by the agglutination test. Cases of this kind are common in Holland, but this is the first English case to be described in a canal worker.

G. W. Watson, J. W. McLeod, and M. J. Stewart<sup>15</sup> record a case of leptospiral jaundice of obscure origin in a previously healthy man, aged 27, an inhabitant of Leeds, who died after an illness of eleven days. No case had been recorded in Leeds or its vicinity for many months, and the disease was probably contracted by bathing in a Yorkshire river when it was unusually low.

L. S. P. Davidson, R. M. Campbell, H. J. Rae, and J. Smith<sup>16</sup> report 19 cases of Weil's disease in Edinburgh and Aberdeen in patients aged from 14 to 67, in 15 of whom the clinical diagnosis was confirmed by bacteriological or serological tests. The fact that 13 of the patients were employed in the handling or cleaning of fish shows for the first time that workers among fish must be included in the occupational groups specially liable to Weil's disease.

P. H. van Thiel<sup>17</sup> carried out experiments on rats and guinea-pigs to determine the most frequent route by which infection takes place. He found that though infection by the mouth was possible, several millions of spirochaetes could be swallowed by these animals without their developing the disease. On the other hand, infection was caused much more readily by the nose and conjunctiva. In all probability, therefore, water inhaled by the nose is much more dangerous for swimmers than swallowed water.

**SYMPTOMS.**—L. Bouman<sup>18</sup> records two cases of Weil's disease in a youth aged 17 and a man aged 28 complicated by *mental symptoms* in the form of schizophrenia associated with meningitis or meningo-encephalitis.

**DIAGNOSIS.**—Davidson and his co-workers<sup>16</sup> state that Weil's disease in the early stage may be suspected in the presence of such symptoms as an abrupt febrile onset, muscular pain, red eyes, and marked prostration, accompanied by a leucocytosis with a shift to the left in the polymorph series, latent icterus with a direct or biphase van den Bergh reaction, and acute nephritis unassociated with oedema or hypertension, and with only slight albuminuria, the presence of granular and cellular casts in the urine, and a raised urea or non-protein nitrogen content in the blood.

**REFERENCES.**—<sup>1</sup>*Bull. Off. internat. d'Hyg. publ.* 1934, xxvi, 1747; <sup>2</sup>*Ibid.* 1749; <sup>3</sup>*Ibid.* 1756; <sup>4</sup>*Ibid.* 1763; <sup>5</sup>*Ibid.* 1765; <sup>6</sup>*Ibid.* 1935, xxvii, 681; <sup>7</sup>*Prensa méd. Argent.* 1935, xxii; <sup>8</sup>*Bull. Off. internat. d'Hyg. publ.* 1935, xxvii, 678; <sup>9</sup>*Med. Jour. Australia*, 1934, ii, 496; <sup>10</sup>*Ibid.* 597; <sup>11</sup>*Brit. Med. Jour.* 1935, i, 1067; <sup>12</sup>*Lancet*, 1935, i, 806; <sup>13</sup>*Ibid.* 1934, ii, 1008; <sup>14</sup>*Ibid.* 1935, i, 86; <sup>15</sup>*Brit. Med. Jour.* 1935, i, 639; <sup>16</sup>*Ibid.* 1934, ii, 1137; <sup>17</sup>*Nederl. Tijds. v. Geneesk.* 1934, lxxviii, 3115; <sup>18</sup>*Ibid.* 1078.

## JOINTS, SURGERY OF.

E. W. Hey Groves, M.S., F.R.C.S.  
K. H. Pridie, F.R.C.S.

## PARAPLEGIA IN POTT'S DISEASE OF THE SPINE.

**Incidence.**—Paraplegia as a complication of tuberculous disease of the spine is both common and distressing, as shown by Percivall Pott in his writings in 1779: "If the patient be an infant, it becomes an object of constant though unavailing distress to its parents; if an adult, he is rendered helpless to himself, and useless to all others, which of all possible states is surely the worst."

R. Weeden, Butler<sup>1</sup> and H. J. Seddon<sup>2</sup> give an analysis of some eight hundred cases of Pott's disease. The gross incidence varies from 5 to 20 per cent, and of the eight hundred cases 11·4 per cent had paraplegia. Tuberculous disease of the spine is a disease of the young, as 6·4 per cent of the cases start in childhood, the onset of the condition being most frequent between the ages of 3 and 6 years. Paraplegia, however, may come on early or late in the disease, an analysis showing an equal number before and after the age of 16.

**Incidence in Relation to Level.**—Tuberculous disease is most common in the thoracic region, and where this region is affected, the cases also appear to be more prone to paraplegia.

**Clinical Types.**—Butler points out that there are three main types of paraplegia: *Early Onset*—Type 1, mild; Type 2, severe. *Late Onset*—Type 3. The early onset, Type 2, has a high mortality of 30 per cent, while the other two are low.

*Type 1 (The Mild Variety).*—This recovers after conservative treatment, but many of the cases are left with extensor plantar reflexes, and rather exaggerated knee-jerks.

*Type 2—(The Severe Variety).*—Cases do not recover.

**Early Onset Paraplegia.**—

**Recovery (Type 1).**—The condition of paraplegia may remain stationary for many months. The majority show improvement after six months' conservative treatment. Factors affecting the prognosis: Although the duration of partial paralysis is not of much importance, the duration of complete muscular paralysis is of great importance. Cases can recover following partial paralysis of six years; but if there has been total muscular paralysis of over six months' duration the chances of recovery are very small.

**Mortality.**—Cases with paralysis may die from septic absorption following bed-sores and urinary sepsis following disturbances of sphincter control; or from a spread of general tuberculous disease throughout the body.

**Pathology.**—The generally accepted theory of abscess pressure will not explain the fact that the paraplegia rises, persists, and recedes in direct relationship to the activity of the disease.

Post-mortem findings of cases show a spread of active tuberculous granulation tissue into the peridural space, where it comes into contact with the meninges. These act as a very effective barrier to the spread of the disease to the cord itself, and there is seldom a pachymeningitis present. The vascular supply to the cord, however, is interfered with. Sections of the cord show fenestration of the white matter, and œdema of the grey; while the vessels over the cord surface are engorged, and in a state of venous congestion.

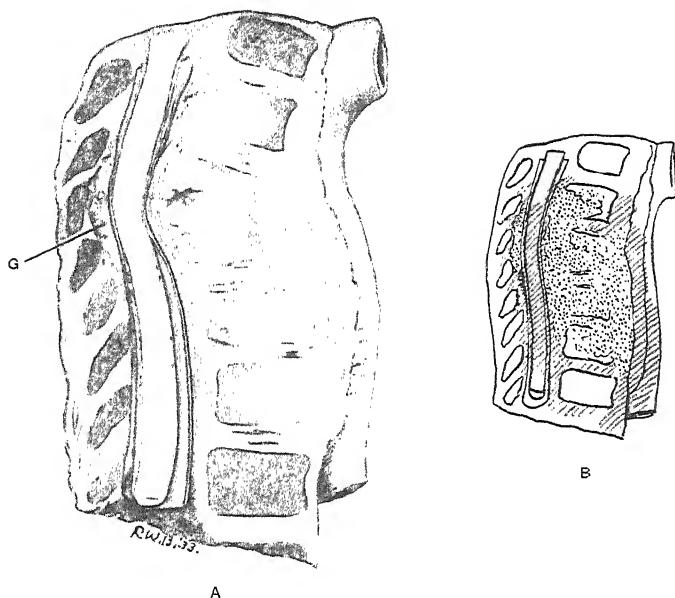
Below the suboccipital region, where the cord is supplied by the vertebral arteries, the blood-supply is by means of small segmental vessels, which reach the cord by passing in along the nerve-roots from vessels in the extradural space. These latter are connected with branches from the vertebral, ascending cervical, intercostal, lumbar, and ilio-lumbar vessels. If the vessels of the extradural space are congested and compressed, the circulation of the cord



## PLATE XLII

### POTT'S PARAPLEGIA

(R. WEEDEN BUTLER)



*Fig. A.* Type I paraplegia without true mechanical compression of the cord, with early mid-thoracic Pott's disease, in a boy aged 5. Tuberculous granulations have invaded the extradural space and have spread round to the posterior surface of the dura (G). The soft parts of almost the whole specimen are oedematous. In B the area of vascular engorgement (shaded red) around the actual area of tuberculous infection (stippled) is emphasized.

*Plates XLII and XLIII by kind permission of the  
'British Journal of Surgery'*

PLATE XLIII

POTT'S PARAPLEGIA—continued

(R. WEEDEN BUTLER)

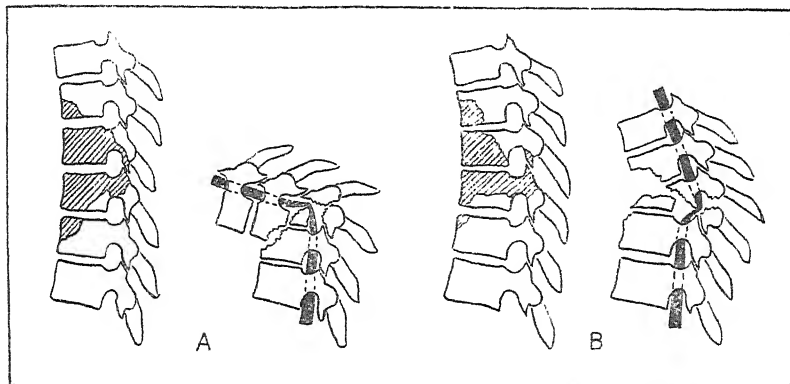


*Fig. B.*—Type I paraplegia. The cord exposed from behind and the dura opened. The cord in the centre of the figure is lying anteriorly in a bed of tuberculous granulation tissue. The dura mater is intact. Enlargement of all the vessels on the cord, especially below the disease, is well shown. (By permission of Mr. H. J. Seddon.)

is interfered with. Certain cases showing a sudden and complete paraplegia have been found post-mortem to have had acute thrombosis of the extradural vessels. (*Plates XII, XIII.*)

*Additional Factors Causing Paraplegia.*—Certain cases develop large abscesses, which in tracking backwards, press on the cord. In many instances these abscesses have formed sinuses, after which the abscess is decompressed, and the paraplegia has spontaneously recovered. This observation has led to the performance of costo-transversectomy and drainage of large abscesses causing paraplegia.

Another cause of paraplegia is dislocation backwards, leading to bony compression on the cord. Where the bodies of one or two vertebræ have been completely destroyed, there is danger of a backward dislocation, causing a nipping of the cord (*Fig. 38*).



*Fig. 38.*—Diagrams showing the two ways in which pinching of the cord may result from pathological dislocation from Pott's disease in the thoracic region. The shaded areas are those in which bone is destroyed. A, The upper segment of the spine has slipped downwards and forwards; B, The segment has slipped downwards and backwards. (*Figs. 38-42 by kind permission of the 'British Journal of Surgery'.*)

**Late Onset Paraplegia.**—This is due to prolonged interference with the extradural vessels by a tuberculous process which affects the circulation of the cord, causing a generalized degeneration below the level of the lesion. Sudden paraplegia generally indicates reactivity of the spinal lesion.

**PROGNOSIS IN POTT'S PARAPLEGIA.**—If the cases are seen early and given good conservative treatment, 60 to 90 per cent resolve completely.

*Factors Affecting the Prognosis.*—Age does not seem greatly to influence this condition, and the prognosis varies with the three types.

In Type 1, paraplegia in extension occurs early in the disease. Where voluntary control is never completely lost, or is only lost for a short time, where the sphincters are not involved, and there is no sensory loss, the prognosis is extremely favourable. If, however, the paralysis is more complete, paraplegia in flexion or flaccid paralysis results. Where there is complete loss of voluntary movement for more than six months, loss of vibration sense, and sphincter trouble, the prognosis is extremely bad. In Type 3 the patients usually die from other complications, and not from the paraplegia.

**PREVENTION AND TREATMENT.**—Early diagnosis and treatment in hyperextension reduce to a minimum the amount of bone destruction. In hyperextension, abscesses tend to press less on the spinal cord, and early immobilization

tends to arrest the disease. As soon as activity has abated, hyperextension should be discontinued and the diseased vertebræ allowed to fall together.

*Operative Treatment.*—Spontaneous recovery is assured in almost every Type 1 case if correct conservative treatment is carried out. Type 2, however, where there is prolonged persistence of paraplegia, needs surgical treatment. The spinal abscess should be decompressed, and where there is indication of abscess pressure a *costo-transversectomy* should be performed.

The advantages claimed for a *costo-transversectomy* are that it relieves the main cause of the paraplegia, i.e., the abscess arising from the disease, and drains it away from the region of the cord. If drainage is performed through a laminectomy, the drainage will be around the cord, and tuberculous granulation tissue is therefore more likely to occur in the extradural space and interfere with the circulation of the cord.

The operation does not weaken the spine as does a laminectomy, the time taken is not great, and there is relatively little operation risk. If a sinus forms, it is regarded as beneficial, as it allows continuous drainage. It will not heal until the spinal lesion is quiescent.

(See also SPINE AND SPINAL CORD, SURGERY OF—SPINAL TUMOURS.)

#### SURGICAL TREATMENT IN OSTEO-ARTHRITIS OF THE HIP-JOINT.

During the past ten to fifteen years surgery has played a part in chronic non-tuberculous arthritis of the hip. Two interesting articles on this subject dealing with the various methods of treatment, and their results, have been written by C. Max Page and T. P. McMurray.<sup>3</sup>

*PATHOLOGY.*—The pathology of this condition, which is essentially a disease of middle and later life, can be discussed under the following headings: (1) Local causes; (2) General causes.

##### 1. Local Causes.—

a. Previous trauma, such as old fractures, dislocations, etc.

b. Nutritional diseases of bone in infancy. Rickets, Perthes' disease, adolescent coxa vara.

c. Congenital dislocations, and the trauma following their treatment; especially after forcible manipulative reduction, such as that recommended by Lorenz.

d. Upset of the local blood-supply causing osteochondritis dissecans.

e. Subacute infections of the joint and arthritis following the zymotic diseases.

##### 2. General Causes.—

a. A generalized toxæmia from localized foci of infection, or from bowel sepsis.

b. Diseases interfering with the nerve-supply of the articular surfaces.

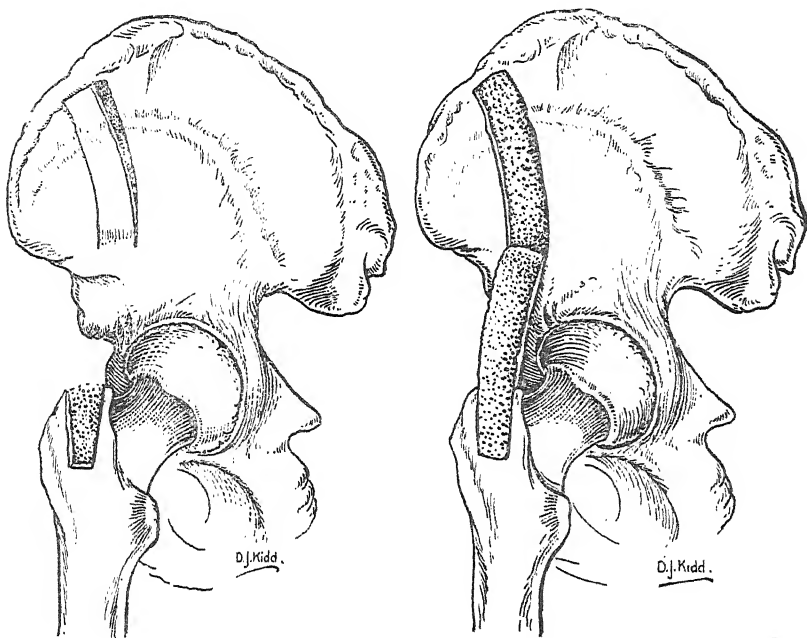
*TREATMENT.*—In the early stages this condition is rarely seen by the surgeon, as these cases are handled by the physician.

At this stage, positional treatment, the supplying of protective apparatus, physiotherapy, and gentle manipulation are indicated. The work of Camitz (Scandinavia) is interesting, and should be given a trial in this country. He advocates a division of the obturator nerve from a mid-line extraperitoneal approach. This is followed by manipulation, and, if necessary, tenotomy of the adductor tendons. This treatment would appear to be sound, in that it will prevent adduction of the hip, and still allow the body weight to be transmitted in the right direction. If this treatment is performed early, Camitz claims that it will prevent much pain and deformity from adduction, and the patient will not be troubled with lumbo-sacral strain due to faulty weight-bearing.

It is, however, the late cases which have received attention from the surgeon. There are certain alternatives in the treatment of advanced osteo-arthritis of the hip, and these can be classified under the following headings :—

1. *Manipulation*.—This can only be employed in certain early cases. It should be used in those cases where pain after strain does not persist for any great length of time, to increase the range of movements. Manipulation should be generally carried out under an anæsthetic. The advanced cases will certainly be rendered more painful by this procedure, but many early cases are greatly improved by it, as they get many months, perhaps years, of comparative freedom.

2. *Rest*.—As the condition becomes more advanced, rest is indicated. This is in order to allow the damaged, swollen, synovial membrane to recover, and also to prevent the diseased bone-ends from grating together. Rest by means



Figs. 39, 40.—Extra- and intra-articular arthrodesis.

of a walking caliper is not altogether sound. It relieves the joint of weight-bearing, but does not prevent movement. A walking spica plaster is the method of choice. The results are consistently good, but on removal of the plaster the pain is likely to recur. It does not alter the pathological condition of the joint, it only gives the patient and the joint a temporary rest.

3. *Arthroplasty*.—The re-modelling and re-shaping of the joint surfaces would theoretically appear to be the best form of treatment, but the results do not bear this out. X-rays taken five or six years after an operation has been performed show a great increase of new bone growth around the reconstructed joint, causing limitation of movement (*Plate XLIV*).

4. *Pseudarthrosis*.—In this operation a new joint is made away from the

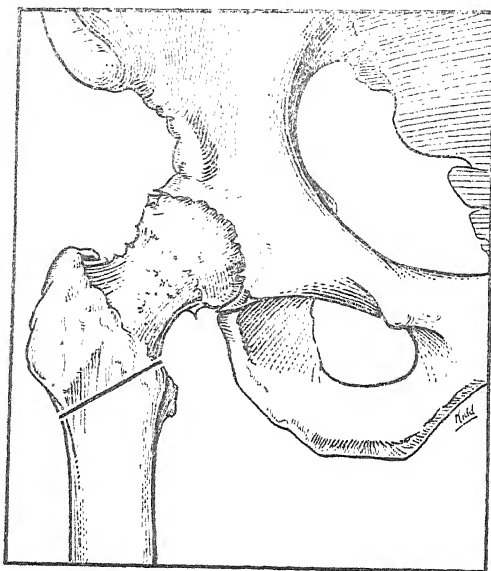


Fig. 11.—Diagram showing site of osteotomy for Lorenz operation.

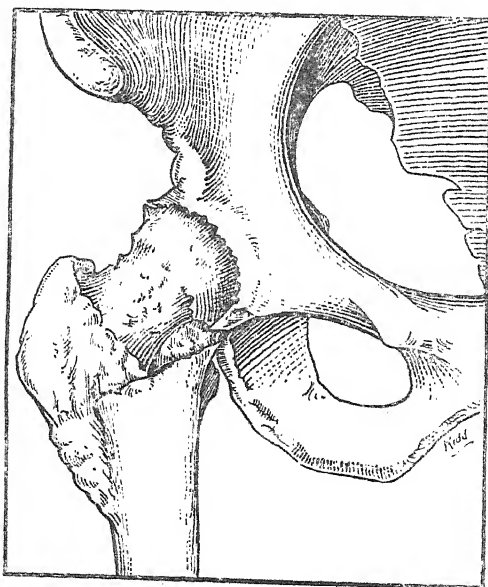
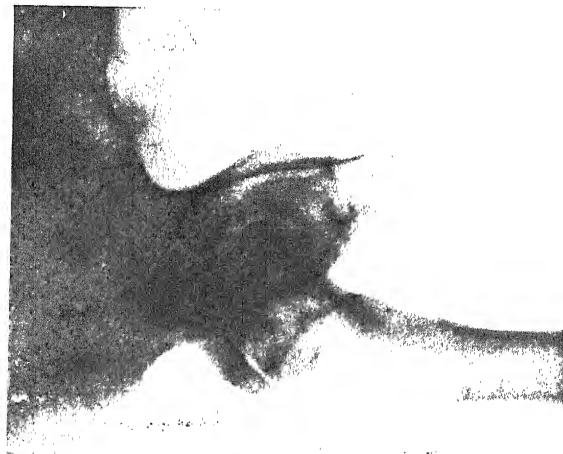


Fig. 12.—Diagram showing position of the fragments after a successful Lorenz osteotomy.

*PLATE XLIV*  
ARTHROPLASTY FOR OSTEO-ARTHRITIS OF THE HIP

(T. P. MCMURRAY)



*Fig. 4.*—The result of an arthroplasty performed five years previously, showing the heaping up of bone on the rim of the acetabulum and consequent limitation of movements.



*Fig. 5.*—Similar result of an arthroplasty after four years.

PLATE XLV

SUBLUXATION OF THE ANKLE

(R. C. ELSLIE)



X-ray of ankle taken in extreme inversion, showing tilting of the astragalus.  
Such a case needs reconstruction of the external lateral ligament.

*By kind permission of 'Annals of Surgery'*



affected region. A part of the neck and shaft of the femur is removed, the distal end of the proximal fragment being capped with the great trochanter, so that a muscle mass is imposed between the two bone fragments, thus preventing subsequent union.

The operation has the disadvantage of rendering the joint unstable. It is chiefly used where there is a bilateral stiffness of the hips, or an arthritis of the lumbar spine which prevents pelvic mobility.

5. *Arthrodesis*.—This is the best procedure for every case of painful non-articular osteo-arthritis. The operation does not always lead to fixation, but where there is failure to obtain this, the clinical result is excellent, as the movement is so slight. It is, however, a difficult operation, causing considerable shock. (Figs. 39, 40.)

6. *Bifurcation Operation*.—In those patients who cannot stand the shock of an arthrodesis, the bifurcation operation is an excellent substitute. It can be performed in a few minutes, and the shock is negligible; while the recumbency period which follows is neither so long nor so continuous as that required after the previous operation. (Figs. 41, 42.)

#### RECURRENT SUBLUXATION OF THE ANKLE-JOINT.

R. C. Elmslie<sup>4</sup> writes on this subject. The movements of inversion and eversion should occur at the subastragaloid joint. After severe inversion strains, if the external lateral ligament is torn, unnatural laxity may occur in the ankle-joint. X-rays taken in forced inversion show, in these cases, marked tilting of the astragalus in the tibiofibular mortice (*Plate XLV*). Ligaments

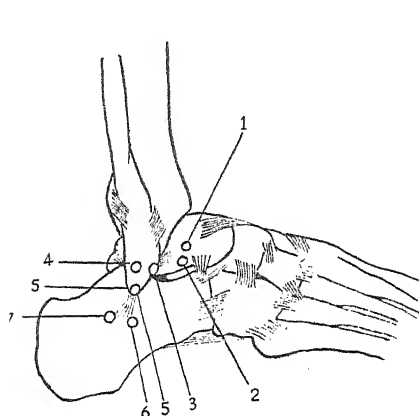


Fig. 43.—Diagram of outer side of ankle-joint, showing the ligaments and drill-holes made in the neck of the astragalus, external malleolus, and os calcis.

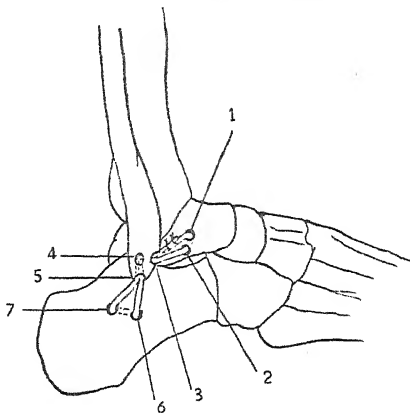


Fig. 44.—Diagram showing the method of passing and suturing the strip of fascia.

which are part of the capsula or thickened bands of the capsula, such as the internal lateral ligament of the knee-joint, tend to repair after rupture if the strain is taken off them for six weeks. Extra-capsular ligaments do not heal in this way, without surgical intervention. The author recommends that a reconstructive operation should be performed in these cases. A new external lateral ligament is constructed from a strip of fascia lata. (Figs. 43, 44.)

REFERENCES.—<sup>1</sup>*Brit. Jour. Surg.* 1935, xxii, April, 738; <sup>2</sup>*Ibid.* 769; <sup>3</sup>*Brit. Jour. Surg.* 1935, xxii, April, 716; <sup>4</sup>*Ann. of Surg.* 1934, c, Aug., 364.

**KALA-AZAR.***Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

An account of work on the transmission of kala-azar is contained in a paper by L. E. Napier,<sup>1</sup> the most important point in which is the mention of further Calcutta work in support of the recent finding that after recovery from the generalized disease about 5 per cent of the cases develop macular lesions of the skin containing the *L. donovani*, but a still larger number harbour the parasite there without evident lesions, and that sand-flies fed on such patients may become infective to others. Such apparently healthy recovered patients may thus become carriers of the disease who are very difficult to detect, and in a year favourable to sand-flies may result in an exacerbation of kala-azar endemicity such as occurs from time to time in India.

REFERENCE.—*Ind. Med. Gaz.* 1935, lxx, May, 267.

**KIDNEY.** (*See also RENAL DISEASES.*)**KIDNEY, SURGERY OF.***Hamilton Bailey, F.R.C.S.*

**Congenital Solitary Kidney.**—The incidence of that important abnormality where the patient has only one kidney needs further scrutiny. For years Morris has been quoted as giving the incidence as 1 in 2400. Clinical experience dictates that this is far too low. M. M. White<sup>1</sup> quotes D. C. Collins, who found the abnormality in 1 in 920 necropsies. H. Wade and I. L. Dick<sup>2</sup> estimate that in Edinburgh congenital solitary kidney is met with in 1 per cent of all cases. One aspect only of the paramount importance of this congenital abnormality is emphasized by the following amazing coincidence :—

A patient, having been gored in the loin by a bull, was rushed to a hospital in the nearby city. His lacerated kidney was removed promptly, but he passed no urine, although he survived for several days. Necropsy showed that the only functional organ had been excised. A few months later, into the same hospital, was admitted a second patient who had been gored by a bull. It was found that the kidney had been wounded, and it was removed. He, too, passed never a drop of urine, and the post-mortem examination revealed that the contralateral organ was congenitally absent. (H. Bailey<sup>3</sup>.)

**Tumours of the Kidney.**—C. D. Creevey<sup>4</sup> remarks that malignant tumours of the kidney rival syphilis as the greatest mimic in clinical medicine. There is a type in which persistent pyrexia is the only symptom, there being no infection to account for the temperature. Most of the pitfalls which await the clinician are connected with the secondary deposits which, in no less than 88 per cent of cases, are the first manifestation of the disease. First and foremost is the growth in a bone. Often it is said that these metastases pulsate; Creevey found this was incorrect. We will here refer to a case described at the Meeting of the Association of Surgeons of Great Britain this year. The case occurred at the Manchester Royal Infirmary. A growth was excised from the head of the femur, which proved to be a secondary Grawitz tumour. Pyelography was, therefore, performed, and a slight aberration of the renal calyx was noted. Nephrectomy (performed by Mr. Rayner) revealed a small primary growth in the kidney. The patient was alive and well a year later. This shows that removal of a secondary Grawitz tumour is often well worth while. The classical case is that of Albrecht, who removed the scapula in which a metastasis developed four years after nephrectomy. The patient was alive and well thirteen years after the second operation. Creevey points out that the first manifestation of a tumour of the kidney is occasionally metastases in the glands of the neck, the female genitalia, or the skin. This author has found that excretion pyelography is unsatisfactory for the diagnosis of tumours of the kidney; retrograde pyelography was required to confirm the diagnosis in every case.

W. Walters and W. F. Braasch<sup>5</sup> also emphasize that reliance cannot be placed on excretion pyelography for the diagnosis of renal neoplasm. In the last 42 cases of renal tumour occurring at the Mayo Clinic the diagnosis was made by means of excretion pyelography in 15 only. Retrograde pyelography and differential tests of renal function are more reliable. In the same series 25 per cent of cases admitted to the Clinic were regarded as inoperable.

Analysing a series of 133 cases of malignant renal tumours, H. Kohlmayer<sup>6</sup> found that 85 per cent were the so-called hypernephromata (Grawitz tumour). A lump was palpable on admission to hospital in 83 per cent. Eight patients showed on the side of the tumour a varicocele which did not disappear during recumbency. Pyrexia not due to pyelitis was noted in 7 per cent.

M. R. Keen<sup>7</sup> has collected thirteen cases of malignant kidney associated with renal tuberculosis. It is questionable whether this dual lesion is a coincidence.

**TREATMENT.**—L. R. Wharton<sup>8</sup> advises the following measures in malignant tumour of the kidney. The first three or four weeks a course of pre-operative irradiation is given, during which time every effort to build up the physical condition of the patient should be made. By pre-operative irradiation a radio-sensitive tumour which fills three-quarters of the abdomen can be so reduced in size that it is hardly palpable. With pre-operative irradiation these cases can be approached with a feeling of hopefulness which was unknown two years ago. This author is of the opinion that transperitoneal nephrectomy has definite advantages. First, it enables one to see the tumour clearly and expose and ligate the renal vessels before handling the malignant mass (*Plate XLVI*). Aberrant vessels can be controlled. The exposure allows the perirenal fat and areolar tissue to be removed *en bloc*. Lastly, the greater portion of the ureter can be excised.

**Results of Nephrectomy for Malignant Renal Neoplasm.**—A post-operative study was made in 1933 of all the patients from whom malignant renal tumour had been removed in the years 1901–27 at the Mayo Clinic. There were 256 patients: 42 per cent lived five years or more after the operation. In 41 cases the malignant tumour was so extensive that the lesion could not be removed. Walters and Braasch<sup>5</sup> consider that post-operative radiation in these cases is without value; indeed, sometimes it seemed to hasten the end.

No case can with certainty be looked upon as cured, as is shown by one of the Middlesex Hospital series, who returned with secondary growths sixteen years after nephrectomy had been performed (E. G. Muir and A. J. B. Goldsmith<sup>9</sup>). K. Walker<sup>10</sup> says that if the patient survives a year, recurrence is less likely to occur, and that it becomes comparatively rare after the third and fourth years.

**Renal Tumours in Children.**—A. Randall<sup>11</sup> finds this one of the most depressing chapters in surgery. He is convinced that the following should be the routine treatment: (1) A course of deep X-ray therapy (these tumours are usually radio-sensitive); (2) Nephrectomy four or five weeks after the conclusion of the course; (3) Further X-ray treatment. Radiation should be controlled by a leucocyte count. If a leucopenia develops it is an indication that the X-rays must be stopped for the time being.

**Congenital Cystic Kidneys.**—Congenital cystic kidneys shows a constant hereditary factor and appear to be transmitted equally by either sex. G. D. Oppenheimer<sup>12</sup> considers the only prevention of the disease lies in the discouragement of propagation in sufferers. Whether polycystic kidney, which is nearly always bilateral, can on occasions be entirely unilateral, is not agreed upon. K. Canonne<sup>13</sup> describes an example of polycystic kidney where the contralateral organ appeared entirely normal. Nephrectomy was performed.

H. T. Murrell<sup>14</sup> reported a case of nephrectomy for polycystic kidney in 1924. In 1934 the patient was perfectly well and in active work as a miner. On the other hand, Oppenheimer states that of 9 patients diagnosed as unilateral polycystic kidney in 1912, 5 developed polycystic changes eventually in the supposed normal organ. This author considers that infection is the most frequent and important complication, and constitutes the chief indication for surgical interference. It is his opinion that nephrectomy should not be performed except, possibly, in examples of persistent suppuration. Occasionally Roysing's multiple punctures of the cysts is beneficial.

**Hydronephrosis.**—Excretion pyelography permits clinical recognition of a hydronephrosis by means of a comparatively simple method. W. F. Braasch<sup>15</sup> has found that many cases of hydronephrosis, which formerly would have been overlooked, are now being diagnosed by the general practitioner.

J. L. Wiseman<sup>16</sup> says that unless the aberrant vessel is small it should not be divided, because it is an end artery and its division amounts to a partial nephrectomy. Temporarily clamping the aberrant vessel by a rubber-covered hæmostat will enable the operator to determine the amount of kidney supplied by the aberrant vessel. When the vessel is too large to permit its division without seriously affecting the blood-supply of the kidney, the ureter will have to be severed from the hydronephrotic sac and re-implanted at another point. Whenever there is a large redundant hydronephrotic sac the major part must be resected, and at the conclusion of the operation the ureter implanted at the most dependent part. The results following anastomosis without resection of the hydronephrosis are exceedingly poor. Conservative plastic procedures are often followed by recovery of kidney function, even in long-standing cases of infected hydronephrosis, providing: (1) The obstruction is removed completely; (2) An adequate amount of the hydronephrotic sac has been excised; (3) Temporary nephrostomy has been provided. Wiseman quotes Walters, who, in a series of 13 cases, found secondary nephrectomy necessary in only one instance.

An aberrant renal artery is seen commonly in the dissecting-room. Unless it passes behind the ureter it is not a cause of obstruction to the ureter (V. Pennell<sup>17</sup>).

C. Y. Bidgood and D. G. Roberts,<sup>18</sup> discussing plastic procedures in hydronephrosis, say that obviously such measures are appropriate in solitary hydronephrotic kidneys and in bilateral obstructive hydronephrosis. In unilateral hydronephrosis the arguments in favour of plastic procedures are not so convincing. These authors incline to F. Hinman's belief that an obstructed kidney will not regain its function even if the obstruction is removed, because the opposite kidney, having undergone anatomical hypertrophy, will not release this function.

**Nephropexy.**—M. Heitz-Boyer<sup>19</sup> considers that instrumental pyelography in the vertical position is important in revealing kinks of the ureter due to nephroptosis. He has a special operating-table which allows the X-rays to be taken in the vertical position during instrumental pyelography.

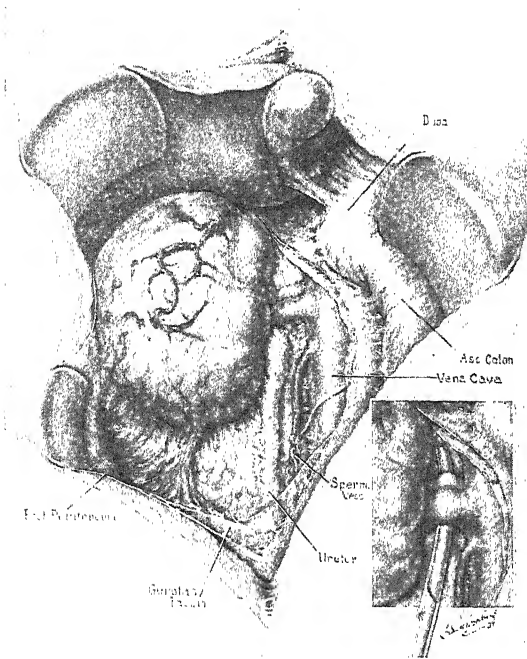
There are a bewildering number of modifications of the operation of nephropexy described this year, among which may be mentioned that of A. Stanischew<sup>20</sup> who transfixes the kidney by the twelfth rib. W. J. Moore<sup>22</sup> advocates transpleural nephropexy as was practised by Maylard. A special aneurysm needle is employed and introduced through the tenth intercostal space.

J. E. Strode<sup>23</sup> illustrates a very simple and effective method of performing nephropexy with a strip of fascia lata. The principles will be clear by referring to Fig. 45.

## PLATE XLVI

### TUMOURS OF THE KIDNEY

(L. R. WHARTON)



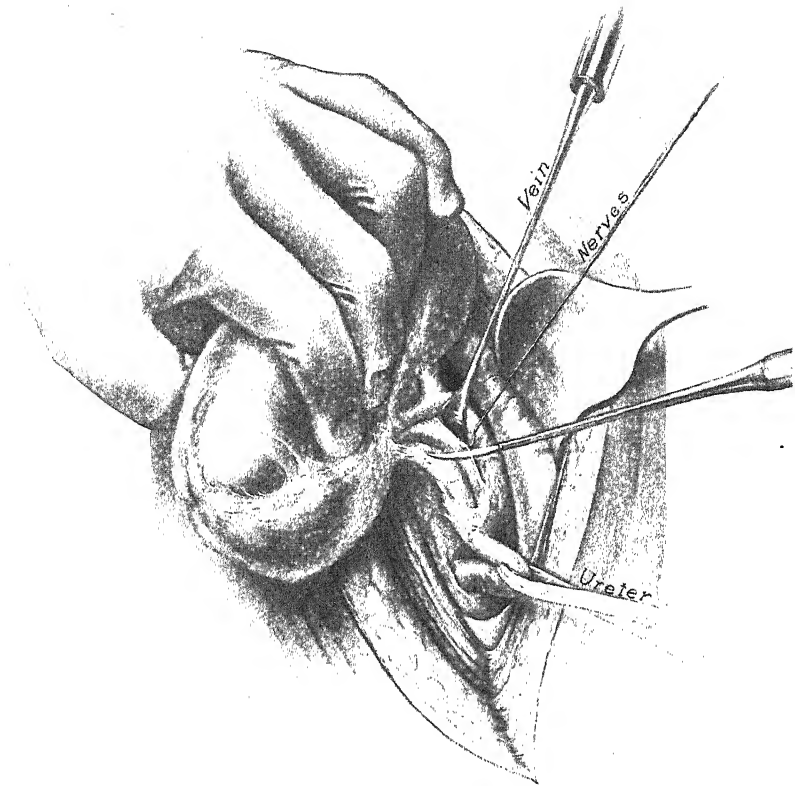
Transperitoneal nephrectomy for renal neoplasm. The anterior route facilitates isolation and ligation of the renal vessels before handling the malignant mass. Other advantages include the removal *en bloc* of the perirenal fat and the greater portion of the ureter.

*By kind permission of 'Surgery, Gynecology and Obstetrics'*

PLATE XLVII

RENAL SYMPATHECTOMY

(C. P. MATHÉ)



*Ralph Sweet*

The sympathetic nerve-fibres are easily located on the superior surface of the renal artery or its main branches, where they are severed. Exposure is facilitated by retracting the vein with a small retractor.

*By kind permission of 'Surgery, Gynecology and Obstetrics'*

**Renal Sympathectomy.**—The main indications for renal sympathectomy are small, painful, non-obstructive hydronephroses and that condition called by H. Harris "the painful abnormal motility syndrome." (M. G. Sutton.<sup>24</sup>) Renal sympathectomy consists of dividing the sympathetic nerve-fibres which are found to course along the superior surface of the renal artery and its many branches. Exposure of the renal artery is facilitated by retracting the renal vein with a small retractor (*Plate XLVII*). (C. P. Mathé<sup>25</sup>.)

**Chyluria.**—B. S. Abeshouse<sup>26</sup> states that the chyle usually enters the urine from the kidney, but it can do so via the ureter or bladder. The urine is white in colour and closely resembles milk. If the condition is suspected the urine should be examined one hour and four hours after a feed of cream. Chyluria is either due to parasites (usually filarial) blocking the lymphatics, or it is non-parasitic (*syn.*, European chyluria). The latter is less frequent and its etiology unknown. In cases of chyluria Abeshouse and others have demonstrated clearly by retrograde pyelography communications between the renal calices and the lymphatic system. These channels outlined by the contrast medium take the form of delicate fibrils radiating from the calices to the space about the kidney.

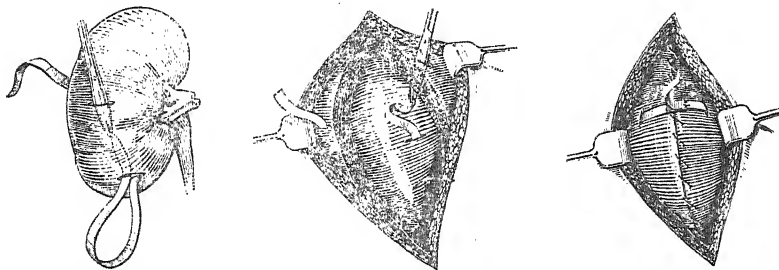


Fig. 45.—J. E. Strode's method of performing nephropexy with a strip of fascia lata.  
(Re-drawn from the 'Journal of Urology'.)

**Anuria.**—Calculous anuria has been dealt with fully in recent issues of the MEDICAL ANNUAL. H. Wade<sup>27</sup> draws attention to anuria due to conditions other than calculus—an important and too-little-discussed subject.

**Anuria associated with Pregnancy.**—First there is a form of renal anuria associated with pregnancy and due to bilateral cortical necroses. Pathologically, the kidneys resemble those seen in phosphorus poisoning. They are large, turgid, and plum-coloured, and bespattered with petechial hæmorrhages. Acute cortical necrosis is often extensive, but it is never complete. Recovery is possible if prompt treatment is instituted (*see URINARY THERAPEUTICS—INTRAVENOUS SODIUM SULPHATE AS A DIURETIC*).

**Anuria due to Low Blood-pressure.**—The importance of taking the blood-pressure and, when possible, seeing that an adequate blood-pressure is maintained, is emphasized.

**Anuria due to Too Rapid Emptying of the Bladder.**—The prevention of this catastrophe lies in gradual and accurate decompression in cases of acute retention.

**Oliguria due to Persistent Vesical Systole.**—This is seen sometimes in tuberculosis. The contracted bladder closes upon the ureteric orifice and, it may be, the only functional side. Under these circumstances serious oliguria results.

**Renal Calculus.**—The first nephrolithotomy was done in 1889 by Sir Henry Morris. The patient was a domestic servant aged 19. Sir Henry made an

incision in the loin and felt the stone. With a probe-pointed bistoury he incised the kidney without delivering it, and extracted with his fingers a mulberry calculus weighing 31 gr. (E. W. Riches.<sup>28</sup>)

"Doctors," writes G. R. Livermore,<sup>29</sup> "are particularly susceptible to urinary calculi": in fact, he has seen more doctors with this condition than people engaged in any other profession or trade.

There have been a number of exhaustive articles (J. S. Joly,<sup>30</sup> A. R. Bliss,<sup>31</sup> H. P. Winsbury-White,<sup>32</sup> F. d'Abreu,<sup>33</sup> F. H. Colby<sup>34</sup>) this year on the cause of renal calculi. There appears to be no one etiological factor. Infection, lack of vitamins, diseases of the parathyroids, dietetics, geography, prolonged recumbency, and the action of ultra-violet light are all factors which have been held partially or totally responsible for the occurrence of stone in the urinary tract. Summing up the position, J. S. Joly, in the Annual Oration before the American Urological Association, said, "I believe that the hypothesis that stone is a deficiency disease is the most plausible. It gives a reason for the change in the incidence of urinary calculi during the past years."

**Non-opaque Stones.**—C. A. Wells<sup>35</sup> says that about 5 per cent of all urinary calculi are non-opaque to X rays. These stones may be displayed in one of three ways: (1) By instrumental pyelography—the stone becomes outlined as a filling defect; (2) By excretion pyelography, the medium being arrested in all films at a certain point; (3) By the non-opaque stone becoming stained by the pyelographic medium.

**Cystinuria.**—H. Wade<sup>36</sup> describes the incidence of cystinuria in a family in which for some generations intermarriage has been the custom. Many members suffered from cystinuria. Five of them have cystine stones. In two of these the stones were revealed by X rays; in the others the stones were non-opaque and were outlined by negative shadows during pyelography.

**Urinary Calculi in Patients with Parathyroid Tumours.**—Thirteen patients at the Massachusetts General Hospital have had parathyroid tumours removed. In eight of these urinary calculi were present. Tumours of the parathyroid cause metabolic disturbances which result in an increase in the output of calcium, and in many instances urinary calculi are present. Unless the parathyroid tumour is removed, stones will recur frequently. (F. H. Colby.<sup>34</sup>)

**Duodenal Fistula following Operations on the Kidney, notably Nephrectomy.**—N. F. Ockerblad and N. G. Gordales<sup>37</sup> have found accounts of nearly 30 cases in the literature, and believe the condition is not very infrequent. The diagnosis of duodenal fistula presents no difficulty. The skin soon becomes excoriated by the escaping ferments. The time of the appearance of the fistula varies within wide limits. In some cases it is within twenty-four hours of the operation; in others the interval is lengthened up to several months. The discharge may be profuse or scanty, according to the size of the fistula. Conservative treatment should be tried in the first instance; in many cases, except in large fistulae, it is successful. The first thing should be to supply the patient with plenty of salt solution intravenously. The second is to prevent excoriation of the skin. A suction apparatus to remove the discharge is useful. A dressing soaked in (1) one-tenth normal hydrochloric acid solution to neutralize alkalinity, and (2) a beef-juice and olive oil preparation for the ferments to expend their activity upon, often acts admirably. Alternatively, a buffer solution consisting of whole milk thickened by the addition of *B. acidophilus* is used. When the fistulous track is obviously large and the amount of secretion is profuse and the health of the patient is declining rapidly, surgical treatment becomes imperative. The fistula must be closed and jejunostomy performed. The high mortality associated with this operative



procedure is due, in a large measure, to hesitation which allows the condition of the patient to deteriorate beyond recall.

(See also ABDOMINAL SURGERY, MISCELLANEOUS.)

**Tuberculosis of the Kidney.**—J. S. Joly<sup>38</sup> finds that sex and age have a considerable influence on prognosis. In children the prognosis is bad; only 6 per cent with unilateral lesions operated on in Marion's Clinic were cured. It is agreed universally that the late mortality after nephrectomy is greater in the male owing to the prevalence of coexisting genital tuberculosis; indeed, in cases where there is coexisting genital tuberculosis the expectation of cure by nephrectomy is halved. The average results obtained by surgical treatment in cases of renal tuberculosis are as follows:—

			Per cent
Operative mortality .. ..	..	..	5
Late mortality (usually due to infections of the remaining kidney) .. ..	..	..	15
Permanent cure .. ..	..	..	50

The remaining patients usually survive many years, although they have foci of active tuberculosis.

Of 500 necropsies performed on patients dying with tuberculosis, bilateral renal lesions were found very frequently, although during life only 25 per cent of the patients had urinary symptoms. (M. E. Greenberger et al.<sup>39</sup>)

**Carbuncle of the Kidney.**—J. A. Lazarus<sup>40</sup> advises that the kidney should be examined at every operation for perinephric abscess in order to rule out the possibility of a coexisting renal carbuncle. Nephrectomy, he says, is seldom necessary in carbuncle of the kidney; nearly all cases respond to simple incision with drainage, especially if the wound is irrigated with Dakin's solution. Providing operation is undertaken early, the prognosis is good.

**Perinephric Abscess.**—In obscure cases of perinephric abscess H. G. Bugbee<sup>41</sup> draws attention to the help which often can be obtained by a plain X-ray. Blurring of the psoas outline on the side of the lesion is characteristic.

**Nephrostomy in Pyelonephritis.**—I. R. Sisk et al.<sup>42</sup> have found nephrostomy a valuable and even a life-saving measure in certain cases of pyelonephritis. The type of case in which it has been used are the acute fulminating infections which do not improve under conservative management; also low-grade chronic processes existing for long periods with progressive renal damage. These authors quote Crosbie, who states, "Double nephrostomy gives more relief than anything else I have found in cases of bilateral chronic pyelonephritis with megalo-ureters."

E. Hess<sup>43</sup> says that Professor von Lichtenberg, in particular, drains a great many infected kidneys by nephrostomy. It is Hess's impression that many of these cases could be treated cystoscopically with catheter drainage.

**Hæmaturia of Obscure Origin.**—A. C. Morson<sup>44</sup> has kept a careful record of 15 cases of arteriosclerosis in which hæmorrhage from some part of the genito-urinary tract has been the predominant manifestation of the disease. Of the 15, 9 patients suffered from renal hæmorrhage, 1 from vesical, 3 from urethral, and 2 developed thrombosis of the penis.

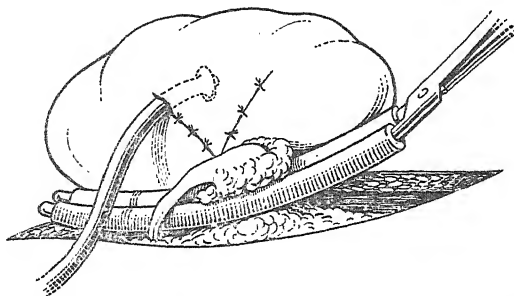
C. M. Le-Roy<sup>45</sup> draws attention to *B. coli* hæmaturia. Usually the hæmaturia is renal in origin, but it may also be vesical. This form of hæmaturia has no special characteristics, but is not, as a rule, associated with any clotting.

**Some Points in the Technique of Renal Operations.**—When removing very large stones from the kidney, in order to arrest hæmorrhage, G. C. Prather<sup>46</sup> applies a 9-in. Doyen's curved intestinal clamp to the pedicle of the kidney. He then makes a V-shaped incision into the kidney. From a series of post-operative pyelograms it is obvious that there is no necrosis of the

V-shaped section of the kidney tissue. The operation is completed by performing temporary nephrostomy. The details of this method are all made evident by a reference to *Fig. 46*.

Speaking of the value of nephrostomy after nephrolithotomy, H. P. Winsbury-White<sup>47</sup> says, "When I consider the anxious time I have had over certain cases upon which I have operated without drainage, and compare it with the uneventfulness of cases in which drainage has been carried out, I am convinced the latter is the proper way."

In a rather complicated pyelotomy, N. F. Ockerblad<sup>48</sup> tore the renal vein. He at once controlled the hæmorrhage by pressure, and then applied a muscle graft, pressing it steadily on to the bleeding point for three minutes. The graft adhered and stopped the bleeding. Ockerblad stresses the value of muscle grafts to stay bleeding in nephrotomy incisions.



*Fig. 46.*—Closure of nephrotomy incision with nephrostomy tube in place. (G. C. Prather.)  
(Re-drawn from the 'Journal of Urology'.)

**Control of Hæmorrhage from the Renal Pedicle by Forci-pressure.**—When a renal tumour is extensive, the patient obese, and the renal pedicle short and infiltrated, it is sometimes wiser to rely upon forci-pressure than on ligature of the renal pedicle. W. Walters and W. F. Braasch<sup>5</sup> give the following details: The forceps should be left in place for seventy-two hours, closing the incision around them. They are prevented from pressing on the retroperitoneal tissues by placing gauze beneath the handles of the forceps. The proper way to remove them is to unlock them, but not to open them completely. After unlocking, they should be allowed to remain in place for six to eight hours. During this time serum will release the forceps from the blood-vessels, and they can be removed without fear of opening the mouth of the blood-vessels.

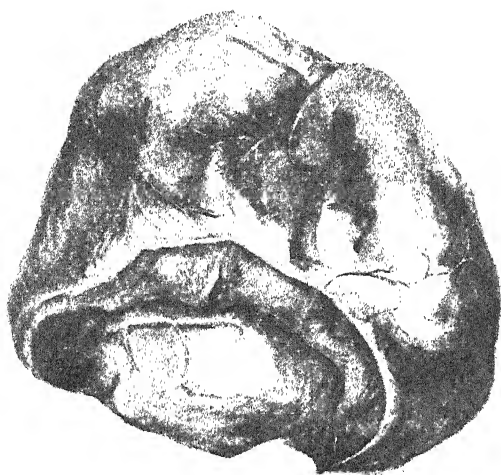
**Partial Nephrectomy.**—H. L. Kretschmer<sup>49</sup> calls attention to the infrequency with which a partial portion of the kidney is resected; partial nephrectomy should be employed more often. Excellent results have followed this operation in suitable cases, which include partial hydronephrosis, massive calculus formation in one pole, renal carbuncle, and a solitary cyst confined to one pole of the kidney.

**On Splitting the Kidney.**—T. W. Mimpriss<sup>50</sup> investigated 17 cases where the kidney had been opened by splitting. There was no operative mortality. Severe hæmaturia occurred in 3 cases. He considers that the line of Hyrtl is definitely less vascular than the remainder of the kidney. A fistula necessitating nephrectomy occurred in one case. The efficiency of the kidney after splitting was inferior to the other side in only 3 cases. The author concludes that the drawbacks to splitting the kidney have been exaggerated. [Incising the kidney with a diathermy knife has been a remarkable improvement, and

PLATE XLVIII

SOLITARY CYST OF THE KIDNEY

(SIR W. J. DE C. WHEELER)



Solitary cyst removed from the upper part of the kidney with surrounding renal parenchyma.

*By kind permission of 'Surgery, Gynecology and Obstetrics'*



it allows large incisions to be made in necessary cases with minimal hæmorrhage both at the time of operation and afterwards.—H. B.]

P. W. Asher<sup>51</sup> points out that it is absolutely unnecessary to split the kidney, even for the removal of the largest stag-horn calculi. Adequate exposure can be obtained by a liberal pyelotomy incision extending into the renal parenchyma. The repair of this incision is comparatively easy.

REFERENCES.—<sup>1</sup>*Brit. Jour. Urol.* 1934, vi, 356; <sup>2</sup>*Edin. Med. Jour.* 1934, xli, 193 (*Med.-Chir. Trans.*); <sup>3</sup>*Emergency Surgery*, 2nd ed., 1935, 341, Bristol, John Wright & Sons; <sup>4</sup>*Arch. of Internal Med.* 1935, lv, 895; <sup>5</sup>*Amer. Jour. Surg.* 1935, xxviii, 23; <sup>6</sup>*Wien. klin. Woch.* 1934, xlvii, 1258; <sup>7</sup>*Amer. Jour. Surg.* 1934, xxv, 467; <sup>8</sup>*Surg. Gynecol. and Obst.* 1935, lx, 689; <sup>9</sup>*Proc. Roy. Soc. Med.* 1935, xxviii, 905; <sup>10</sup>*Lancet*, 1935, i, 565; <sup>11</sup>*Ann. of Surg.* 1934, c, 462; <sup>12</sup>*Ibid.* 1136; <sup>13</sup>*Bull. et Mém. Soc. de Chir.* 1934, 628; <sup>14</sup>*Brit. Jour. Urol.* 1935, vii, 40; <sup>15</sup>*Jour. Amer. Med. Assoc.* 1933, ci, 1848; <sup>16</sup>*Ann. of Surg.* 1934, c, 445; <sup>17</sup>*Lancet*, 1935, i, 261; <sup>18</sup>*New Eng. Jour. Med.* 1935, ccxii, 705; <sup>19</sup>*Bull. et Mém. Soc. nat. de Chir.* 1935, lxi, 644; <sup>20</sup>*Zentralb. f. Chir.* 1934, lxi, 2431; <sup>21</sup>*Surg. Gynecol. and Obst.* 1935, lxi, 58; <sup>22</sup>*Jour. of Urol.* 1934, xxxii, 171; <sup>23</sup>*Med. Jour. Australia*, 1933, ii, 135; <sup>24</sup>*Surg. Gynecol. and Obst.* 1933, lvii, 538; <sup>25</sup>*Amer. Jour. Surg.* 1934, xxv, 427; <sup>26</sup>*Edin. Med. Jour.* 1934, xli, 193 (*Med.-Chir. Trans.*); <sup>27</sup>*Brit. Jour. Urol.* 1935, vii, 140; <sup>28</sup>*Amer. Jour. Surg.* 1935, xxviii, 253; <sup>29</sup>*Jour. of Urol.* 1934, xxxii, 541; <sup>30</sup>*Ibid.* 1933, xxx, 639; <sup>31</sup>*Brit. Jour. Urol.* 1935, vii, 103; <sup>32</sup>*Ibid.* 34; <sup>33</sup>*Surg. Gynecol. and Obst.* 1934, lix, 210; <sup>34</sup>*Proc. Roy. Soc. Med. (Urol. Sect.)*, 1935, xxviii, 909; <sup>35</sup>*Ibid.* 582; <sup>36</sup>*Amer. Jour. Surg.* 1935, xxviii, 105; <sup>37</sup>*Lancet*, 1934, ii, 1119; <sup>38</sup>*Jour. Amer. Med. Assoc.* 1935, civ, 726; <sup>39</sup>*Amer. Jour. Surg.* 1934, xxv, 155; <sup>40</sup>*Ibid.* xxvi, 255; <sup>41</sup>*Ibid.* xxv, 451; <sup>42</sup>*Calif. and Western Med.* 1934, xli, 73; <sup>43</sup>*Proc. Roy. Soc. Med. (Urol. Sect.)*, 1934, xxvii, 87; <sup>44</sup>*Arch. ital. di Urol.* 1934, xi, 311; <sup>45</sup>*Jour. of Urol.* 1934, xxxii, 578; <sup>46</sup>*Brit. Jour. Urol.* 1934, vi, 149; <sup>47</sup>*New Eng. Jour. Med.* 1934, ccx, 906; <sup>48</sup>*Trans. Amer. Assoc. of Genito-Urin. Surgeons*, 1934, xxvii, 249; <sup>49</sup>*Lancet*, 1934, ii, 921; <sup>50</sup>*New Eng. Jour. Med.* 1934, ccxi, 1196.

Sir W. I. de C. Wheeler, F.R.C.S.I.

**Solitary Cysts of the Kidney (Upper Pole).**—W. C. Quinby and E. F. Bright<sup>1</sup> discuss the etiology, pathology, and symptoms of solitary renal cysts. Seven cases are reported. Non-radiating pain in the back or right upper quadrant of the abdomen was present in most cases. One-third had symptoms of cystitis and one-third chills and fever. About one-fourth had gross hæmaturia. In two-thirds of the cases physical examination was negative. The most accurate means of diagnosis is pyelography. [In 1931 the reviewer removed a solitary cyst from the upper pole of the kidney of a woman aged 57. (Wheeler, Murphy Oration, *Surg. Gynecol. and Obst.*, vol. lvi, p. 16). Hæmaturia and a smooth painless enlargement of the right mobile kidney were the outstanding clinical features. Pyelography revealed the upper calices occluded and deformed. There was slight hydronephrosis on the left side. The blood-urea was high (72 mgrm. per cent); the urea-concentration test revealed an excretion of 1.5 per cent urea three hours after the meal. The cyst was the size of a tangerine orange. The upper pole of the kidney with the cyst was removed by wedge-shaped incision. The cut renal surfaces were approximated with sutures of the Halsted type. A piece of muscle tissue introduced under the loops of the sutures preventing them cutting through. *Plate XLVIII* shows the cyst surrounded by renal substance. Recovery was uneventful.—W. I. de C. W.] Solitary cysts of the kidney are rare; only 99 cases had been reported in 1926 (Fullerton<sup>2</sup>).

**Cancer of Renal Pelvis.**—E. Franceschi<sup>3</sup> mentions the pathology and clinical aspects of squamous-celled carcinoma of the renal pelvis. Pyelography is the only reliable method of diagnosis. A typical filling defect in the renal pelvis is seen when the contrast medium is introduced into the pelvis from below. He mentions a sign (not previously described) of this condition—viz., prolapse of the intramural portion of the ureter into the bladder. [The reviewer<sup>4</sup> has found that squamous-celled carcinoma is usually associated with renal calculi. In a case recorded in 1924 there were four stones in the upper pole and ten in the lower pole. The squamous-celled carcinoma of the pelvis was

discovered after nephrectomy. A series of sections demonstrated the transition from pelvic to squamous epithelium. Squamous cells were also imbedded in dense fibrous tissue in the capsular area. The condition is rare and is another example of the development of cancer from prolonged irritation. The irritation may be either due to stone or bacterial invasion. In a personal communication Dr. McCarty, of the Mayo Clinic, told the reviewer that in 1648 kidneys which came to operation in ten years 7 epitheliomata were found.—W. I. de C. W.] Franceschi thinks that simple nephrectomy as opposed to removal of both kidney and ureter is the operation of choice.

**Malignant Tumours of the Kidney in Children.**—E. A. Pohle and G. Ritchie<sup>5</sup> give their views on malignant tumours of the kidney in children. They conclude that the best treatment is irradiation followed by removal and subsequent post-operative irradiation. It is stated that the ultimate mortality is well over 90 per cent. If this figure is correct, irradiation is scarcely worth while. Before irradiation treatment was adopted the mortality was estimated at about 80 per cent.

[These growths are more in the kidney than of the kidney, and consequently from an early date no urine is excreted from the affected side. Pain and hæmaturia are absent in consequence. The tumour extends; the renal tissue becomes flattened out and finally forms a pseudo-capsule comparable to that found in cases of enlarged prostate. Up to the point of rapid enlargement the silent nature of these tumours is impressive. Removal by the transperitoneal route is not difficult, but a very long incision is imperative to facilitate the rapid dislocation of the tumour from the abdomen. The lumbar route should never be employed. In a case of the reviewer's<sup>6</sup> the operation was complete in fifteen minutes. There was a recurrence in six months and the child died within a year. Microscopically the tumour consisted of true renal tissue, adenomatous tissue, sarcomatous tissue, non-striped muscle, connective tissue, and vascular tissue. Striped muscle was also present and in this respect the microscopic findings were unusual.—W. I. de C. W.]

REFERENCES.—<sup>1</sup>*Jour. of Urol.* 1935, xxxiii, 201, Abstr. in *Surg. Gynecol. and Obst.* 1935, Aug., 158; <sup>2</sup>*Brit. Jour. Surg.* 1926, xiv, 629; <sup>3</sup>Abstr. in *Surg. Gynecol. and Obst.* 1935, July, 44; <sup>4</sup>*Ibid.* 1924, 4; <sup>5</sup>*Ibid.* 1935, July, 43; <sup>6</sup>*Ibid.* 1924, Feb., 1.

## LABOUR AND ITS COMPLICATIONS.

*Beckwith Whitehouse, M.S., F.R.C.S., F.C.O.G.*

**Breech Presentations.**—The intranatal and neonatal mortality associated with breech cases has been estimated by G. F. Gibberd<sup>1</sup> as 39 per cent, and Watts Eden,<sup>2</sup> commenting upon the heavy toll of infant life, has observed that "the art of managing this particular type of difficult labour has not reached a point at which we can afford to rest content". The publication, therefore, by J. W. Burns<sup>3</sup> of a simplified method of dealing with the after-coming head, and by C. McIntosh Marshall<sup>4</sup> of a new technique for the delivery of the breech with extended legs in primipara, is of some interest.

Burns criticizes the principles which underlie the various two-handed grips commonly employed during delivery of the head on the basis that they induce the operator to use more force than is necessary. He deprecates any assistance being given to descent of the presenting part, in the case of a normal breech, by abdominal or frontal pressure, as such interference may encourage early separation of the placenta.

During the second stage of labour the patient is placed in the lithotomy position, and as soon as the arms and shoulders are delivered the child's body is allowed to hang downwards from the vulva (*Fig. 47*). This produces flexion of the head and brings the nape of the neck well into the subpelvic angle; it



Fig. 47.

Fig. 47.—Delivery of the after-coming head by Burns's method. The effect of the body-weight bringing the head through the brim.

Fig. 48.—The position of the infant at the moment the grip is first applied and traction is exerted.

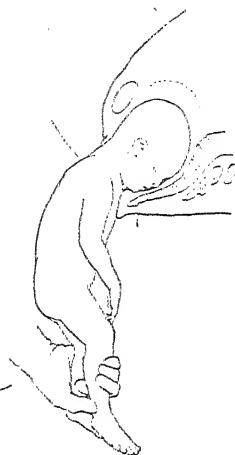


Fig. 48.

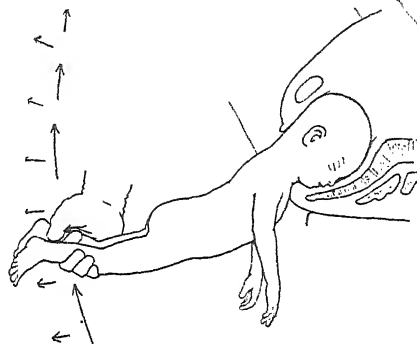


Fig. 49.—The direction of the forces necessary for delivering the head by flexion.

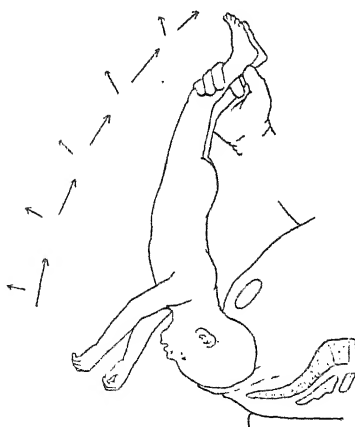


Fig. 50.—Completion of delivery.

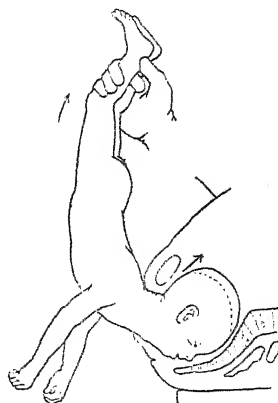


Fig. 51.—Showing the effect of elevation without sufficient traction and the danger of injury to the cervical spine.

(Figs. 47-51 by kind permission of the 'Journal of Obstetrics and Gynaecology of the British Empire'.)

also has the advantage that no traction is required on the part of the obstetrician and undue haste in delivery is avoided. Actual delivery of the head is effected in Burns's method as follows: (1) The operator stands sideways to the buttocks of the patient and uses that hand which is further away from the mother. (2) Only one hand is used in lifting the child over the mother's abdomen. (3) The child's ankles are seized when in their most dependent position and tension applied through traction to the legs as indicated in Figs. 48-51. During tension the neck is kept taut, and this is maintained until the head is delivered. The author observes that when standing sideways to the patient and using only one arm, the obstetrician is employing his power of abduction, and so diminishes the force which he directly applies. The latter is further reduced by the necessity of raising the child through 180°. Only when the weight of the child's body is insufficient to bring the head into the pelvis is the application of suprapubic pressure justifiable. This should always be performed by the obstetrician and not delegated to an assistant. Burns rightly draws attention to the avoidance of all haste during the important stage of delivery of the after-coming head. Eight minutes can safely elapse from the time the umbilicus is born until the head is delivered, and five minutes between the birth of the shoulders and head.

The problem of delivery of the complicated *breech with extended legs* in the case of primiparae is one upon which diversity of opinion still exists. The more usual procedure is to bring down the legs, a practice supported by A. Bourne<sup>5</sup> at a meeting of the Gynaecological and Obstetrical Section of the British Medical Association at Eastbourne in 1931. The alternative policy of *laissez-faire* was advocated by Eardley Holland<sup>4</sup> during the same discussion, and the latter has recently received support from C. McIntosh Marshall, who describes a new technique for delivery of the breech with extended legs. Marshall concludes that without assistance of some kind the primipara will only rarely accomplish spontaneous delivery in time to ensure safety of the full-time child. He also is of opinion that the undisturbed presenting part, in the extended breech, is the best dilator of the cervico-vaginal canal.

The author's technique in the case of a left sacro-anterior position is described as follows: Delivery is usually begun when the anterior buttock is visible at the vulva, and the posterior buttock distending the perineum. In a few cases of delayed labour it may be necessary when the anterior groin can be conveniently reached with the right index finger. The patient is placed in the lithotomy position with the buttocks over the end of the couch. The bladder is catheterized, and the tissues of the posterior edge of the vulva, posterior vaginal wall, and perineum are rendered completely analgesic by infiltration with a few cubic centimetres of  $\frac{1}{2}$  per cent novocain. The index finger of the right hand is then passed up behind the symphysis into the anterior groin and steady groin traction exerted until the anterior buttock lies completely beneath the pubes (*Plate XLIX*). At this stage a medio-lateral episiotomy is made on the same side as that on which the sacrum is descending. Traction is continued under chloroform anaesthesia, and when delivery is effected as far as the popliteal spaces, pressure in the latter, directed away from the mid-line, flexes the legs on the thighs and detaches the feet from the vulva.

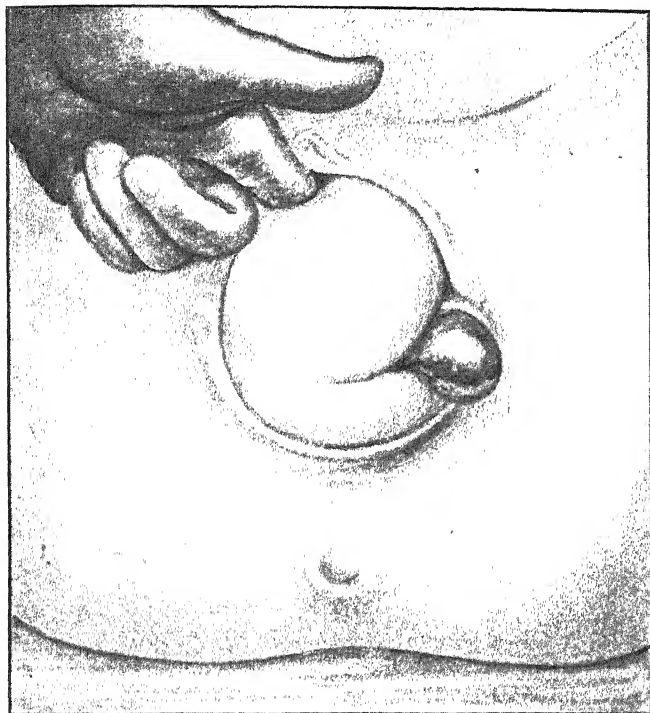
Should the arms also be extended, a complication which commonly accompanies extension of the legs, the *posterior arm* is sought as soon as definite resistance to further traction is experienced. The ankles are seized with the operator's left hand, the trunk raised so that the child's abdomen approaches the mother's right groin, while the right hand is passed upwards over the right shoulder and the bend of the elbow reached with the tips of the



*PLATE XLIX*

BREECH PRESENTATION

(C. MCINTOSH MARSHALL)



Treatment of breech with extended legs. Delivery of the buttocks by groin traction.  
It is just prior to this moment that episiotomy is usually performed.

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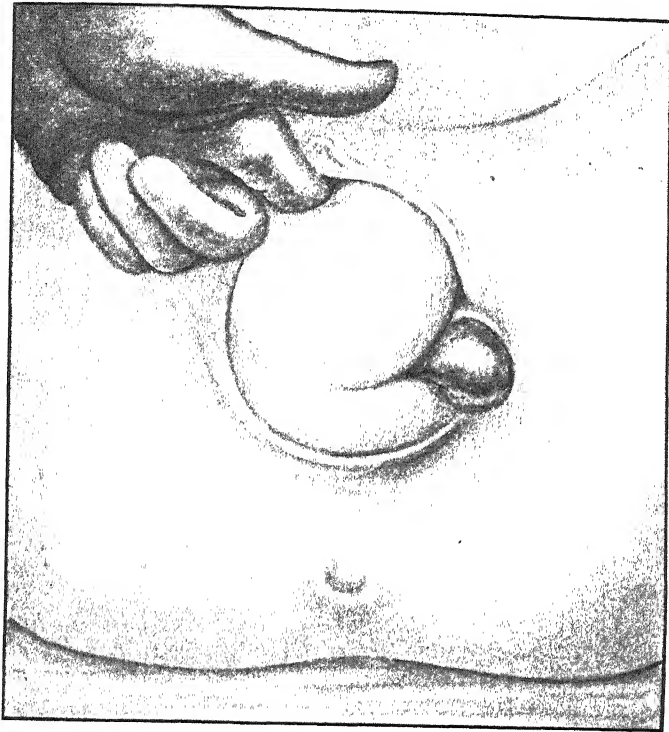
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fingers. The arm is then flexed and brought down over the chest in the usual manner.

In a series of 36 difficult breech deliveries, including 28 primiparæ, only 1 child was stillborn—a figure which tends to substantiate the claims of the authors for the safety of the methods they describe.

Most obstetricians will endorse the view that the manœuvre of bringing down the legs in an extended breech is by no means an easy operation, and in the case of primiparæ can be exceedingly difficult. Marshall's method, involving as it does a very simple and uncomplicated technique, appears therefore worthy of extended trial. Should the claims of the authors be justified as the result of further experience, it would appear that the arguments in favour of version as a prophylactic measure in the case of breech presentations lose much of their force.

REFERENCES.—<sup>1</sup>*Brit. Med. Jour.* 1932, ii, 369; <sup>2</sup>*Lancet*, 1931, ii, 1223; <sup>3</sup>*Jour. Obst. and Gynecol. Brit. Emp.*, 1934, xli, Dec., 923; <sup>4</sup>*Ibid.* 930; <sup>5</sup>*Brit. Med. Jour.* 1931, ii, 294; <sup>6</sup>*Ibid.*

## LARYNX AND TRACHEA, AFFECTIONS OF.

F. W. Waikyn-Thomas, F.R.C.S.

**Paralysis of the Laryngeal Muscles due to Lead Poisoning.**—M. C. Myerson<sup>1</sup> has collected 20 cases of this condition. This type of paralysis is rare; in 405 cases of lead poisoning reported by W. D. Prendergast in 1910 there were none of laryngeal paralysis. From what is known of lead poisoning generally the laryngeal lesions may fall under any one of four groups: (1) Neuropathic; (2) Myopathic; (3) Encephalopathic; and (4) A combination of neuropathic and myopathic. In some cases the larynx is affected early, but in the majority the laryngeal signs are late. In some cases there has been complete recovery. A consideration of the various laryngeal paralyses due to this one cause throws doubt on the validity of Semon's law. This is "that the fibres of the motor nerves to the abductors succumb to organic affections sooner than, or exclusively of, the adductors." In 7 out of the 20 cases which Myerson has collected there was paralysis of muscles other than the abductors without abductor palsy. This must be regarded as definite evidence against Semon's generalization. In the discussion which followed, an interesting point was raised—certain cosmetics, especially some kinds of lip-stick, contain lead!

**Abscess of the Larynx.**—J. D. Kernan and H. P. Schugt<sup>2</sup> discuss the treatment of laryngeal abscess. As a complication of typhoid fever this condition used to occur more frequently than it does now, but it is described under so many names that the true incidence is masked. For example, 'œdema of the larynx', 'perichondritis of the larynx', 'phlegmon', and 'abscess' of the larynx are all more or less the same disease in different stages of development. The only form of the disease which has its origin in the larynx itself is the *traumatic*, e.g., following blows or lacerations, the ulceration of a tumour with secondary infection, or (but this is rare) injury from a foreign body. All other cases must be regarded as secondary to infection elsewhere, e.g., typhoid or scarlet fever, septicæmia and erysipelas, syphilis (but very rarely); most of the cases recently reported have followed influenza or acute tonsillitis. The symptoms are deep-seated pain, increased by pressure or swallowing, tenderness, the sensation of a foreign body, hoarseness, usually present but not very marked if the abscess is on the outer side of the larynx, e.g., in cases where the abscess bulges into the pyriform fossa, and dyspnoea. The appearance of the abscess depends on the cartilage attacked, and on the degree of ossification. In adults there may be an osteomyelitis as well as a perichondritis. In abscess of the thyroid cartilage the upper and posterior parts of the cartilage form an

unyielding wall, so the outer wall and floor of the pyriform fossa bulge upwards; if only the floor bulges, the cricoid and the neighbouring part of the thyroid may be attacked. As a rule the involvement of the larynx is much greater than it appears to be on examination.

In cases limited to the arytenoids recovery often takes place without operation. Isolated abscess of the epiglottis is not common, but when it does occur recovery quickly follows incision. In abscess of the thyroid or cricoid the condition is much more dangerous. The authors advise treatment on these lines:—

1. *Arytenoids*.—With unilateral perichondritis it is safe to wait. If both sides are affected, tracheotomy may be needed. If the swelling does not recede in about a week, it must be taken that osteomyelitis of the arytenoid is present, and laryngofissure should be done. The inner surface of the arytenoid should be opened down to the marrow cavity with a sharp curette. If there is actual sequestration, the dead tissue should be removed. The lateral part with the muscular attachments should be saved.

2. *Thyroid Cartilage*.—If the thyroid alone is affected, it is better to expose it from without and, if necessary, do a window resection to expose the perichondrium on the inner surface of the larynx. This avoids opening the laryngeal cavity.

3. *Cricoid Cartilage*.—A tracheotomy cannot be avoided, but as much of the cartilage must be saved as is possible in order to avoid laryngeal stenosis. The larynx must usually be opened, and a semicircular incision carried backwards externally over the posterior half and up on to the arch. Cartilage firmly adherent to its perichondrium will probably recover.

[It is interesting to notice that in the discussion which followed this paper all the speakers referred to personally seen cases. This makes it probable that the condition is much more frequent than would appear from the literature on the subject. The general opinion was in favour of open-operation as suggested in this paper.—F. W. W.-T.]

**The Effects of Radium Emanations on the Laryngeal Cartilage.**—These are discussed by M. F. Arbuckle, E. V. Cowdry, and R. Votaw,<sup>3</sup> who believe that in gold radon seeds the beta rays decay within the gold case, while the gamma rays pass into the tissues. From a consideration of cases they thought it probable that the lethal dose of gamma rays for carcinoma cells was below the dose which would damage cartilage cells. They tried a series of experiments on dogs to find whether this was true. The seeds were planted in contact with the laryngeal cartilages, and doses of from 66 to 199 millicurie hours were given to seven dogs. Histological examination showed tissue reaction but no evidence of necrosis or perichondritis. There was some evidence for thinking that calcification of the cartilage was increased.

**Röntgen Radiation Necrosis of the Larynx and Other Structures of the Neck.**—P. A. Nelson and E. E. Hirsch<sup>4</sup> state that there are three types of radiation reaction:—

1. *Immediate Reaction*.—Moderate swelling of the neck, especially of the lymph glands and subcutaneous fat, occasional salivation.

2. *The True Röntgen Reaction*, occurring from ten to twenty days after irradiation: dryness of the throat, hoarseness, fibrinous exudates on the mucosa.

3. *Late, and Serious, Reactions*, occurring from four weeks to a year after treatment: scar tissue formation, cedema of the neck, perichondritis, and necrosis of the larynx. These may occur without any indications of the first and second stages.

The case the authors describe was a patient who had a series of twenty treatments of the neck for a carcinoma of the tonsil. Six months later he was

admitted to another hospital as a case of tuberculous laryngitis, and died six weeks later. The entire larynx was necrotic, the œsophagus was œdematous and ulcerated, and there were changes in the myocardium, lungs, liver, and kidneys. The writers attribute this to an excessive dosage and to mixtures in dosing.

[These two papers taken together show the dangers of radiation, and show that the dangers are not insuperable.—F. W. W.-T.]

**Cancer of the Larynx.**—G. Tucker<sup>5</sup> summarizes the results in 200 consecutive cases of cancer of the larynx, treated in the bronchoscopic clinics of the University of Pennsylvania. Of these patients, 41 per cent had used their voices excessively, 12 per cent were immoderate smokers; all this group had hoarseness and local discomfort, 22 per cent had dyspnœa, and 58 per cent dysphagia. Local or referred pain was not noticed until the later stages.

In nearly all the cases the lesion was demonstrable by skiagrams. Biopsy was done in all cases, and in no single instance was there any ill effect, either locally or by indication of metastatic spread. Ninety-five per cent of the lesions were squamous-celled carcinoma. In 72 per cent the lesion had probably started as an intrinsic growth, and would have been of favourable prognosis if it had been diagnosed in time. *Laryngofissure* was done in 58 per cent of the cases, with recurrence within two years in 14 per cent. *Total laryngectomy* was done in 31 cases, with 37 per cent of recurrence. *Partial laryngectomy with laryngostomy* and maintenance of an open wound for one week for direct application of *radium* was done in 17 cases. In 54 cases *X-ray and radium* treatment was given. Three of these patients are still alive after three years, but no fair estimate of the results can be made, as a variety of methods was used.

P. Frenckner<sup>6</sup> states that at the present day 30 per cent of permanent cures of laryngeal carcinoma can be expected after total laryngectomy, with a primary operative mortality of from 5 to 10 per cent. In his method of treatment of any individual case, Francker takes Soerensen's classification, based on the extent of the growth, as his indication.

*Group 1.*—Carcinoma limited to the middle part of one cord, without extension into the anterior commissure or into the vocal process of the arytenoid. These cases he regards as equally suitable for laryngofissure or for radium treatment; either method should give from 80 to 90 per cent of cures, but laryngofissure has the advantage that it enables us to be sure of the real extent of the involvement.

*Group 2.*—This includes all cases which, although more extensive than those of Group 1, have not transversed the mid-line behind or the anterior commissure, have not invaded the cartilage, and have not reached the introitus laryngis above. The less extensive cases are suitable for radium; the more extensive should be treated by hemilaryngectomy followed by irradiation.

*Group 3.*—This comprises all endolaryngeal carcinomata which are not absolutely unilateral. Whether or not there are local glandular metastases, the operation advised is laryngectomy followed by irradiation.

*Group 4.*—All external laryngeal cancers. Except in the few cases where laryngectomy gives a fair chance of removal of the whole growth, irradiation is advised.

Frenckner does not believe in pre-operative radiation. In his last group of 14 cases of laryngectomy he has operated in two or three stages, following the Mayo Clinic technique.

**Malignant Tumours of the Trachea.**—F. C. Ricci<sup>7</sup> describes three cases. The first patient had had retrosternal discomfort for seven years with dysphagia and, later, dyspnœa. Skiagrams taken over this period showed nothing until the later stages, when a shadow was seen in the trachea with œsophageal

obstruction. Direct examination showed a large mass filling the trachea. He died during an attack of dyspnoea. In the second case the history was similar but much shorter. In both cases the growth was a squamous-celled carcinoma. In the third case the growth, a fibro-myxo-chondro-endothelioma, lay just below the cords. Under *radium treatment* the growth disappeared for six months but recurred. These cases are more common in males and occur in late middle life. The first signs are the retrosternal pressure with some dyspnoea, purulent or blood-stained sputum, and dysphagia. The voice is not affected unless the cords are subjected to the pressure of a growth high up, or unless the recurrent laryngeal nerve is involved. Endoscopic removal is rarely possible; radiotherapy gives temporary relief, but recurrence is the rule. External operation and excision is occasionally possible.

**Experimental Tuberculosis of the Respiratory Tract.**—T. Milschtein and P. Pougatsh<sup>8</sup> discuss this subject. It is a question whether primary infection of the larynx by tuberculosis is possible. It is also undecided whether infection secondary to pulmonary tuberculosis takes place through direct infection of the mucosa by organisms in the sputum or whether it is by the lymphatics and the blood-stream. A further point of interest is whether the nervous system plays any part in the process. In rabbits it was found that injection of tubercle bacilli into the auricular vein always caused pulmonary tuberculosis. In other rabbits an emulsion of the organisms was applied to the larynx through a tracheotomy opening. In a third series the organisms were injected into the superior thyroid artery. It was found that infection by contact caused a virulent type of disease, but the blood-stream lesions often remained latent unless the muscles or nerves were interfered with. On the other hand it was found impossible to cause a contact infection in animals in which the superior laryngeal nerves had been cut; it is thought that the hyperæmia and congestion caused by the vasomotor paralysis following division of the nerves prevented infection.

**Lupus Vulgaris and Phthisis.**—C. Ebskov,<sup>9</sup> in a paper on the frequency of lupus vulgaris affecting the mucous membranes of the upper air-passages, and its occurrence in combination with pulmonary tuberculosis, deals with three questions: (1) How many patients with skin lupus, with or without lupus of the mucous membranes, have also phthisis? (2) Is lupus of the mucous membranes particularly liable to be associated with phthisis? (3) Is there any relation between the degree of distribution of lupus of the mucous membranes and phthisis? In eleven years at the Finsen Institute 823 cases of lupus were seen; in 280 there was lupus of the skin and of the mucous membranes; in 81 the mucous membranes alone were infected. It was found that lupus of the buccal cavity was always associated with lupus elsewhere—in the skin, nose, pharynx, or larynx: 19 per cent of patients with lupus of the skin and mucosa had phthisis, but only 11 per cent of those with lupus of the mucosa alone. On the other hand, there was a relation between the distribution of the lupus and lung infection. Phthisis was most common among patients with laryngeal lupus. Where four regions, nose, mouth, pharynx, and larynx, were affected the percentage of phthisis was nearly double that where only two regions were affected. The pulmonary tuberculosis which is found in combination with lupus is usually of the chronic type and is rarely active.

REFERENCES.—<sup>1</sup>*Trans. Amer. Laryngol. Assoc.* 1934, 236; <sup>2</sup>*Ibid.* 180; <sup>3</sup>*Ibid.* 214; <sup>4</sup>*Jour. Amer. Med. Assoc.* 1935, civ. 1576; <sup>5</sup>*Arch. of Oto-Laryngol.* 1935, xxi, 1; <sup>6</sup>*Acta Oto-Laryngol.* 1935, xxi, 370; <sup>7</sup>*Arch. ital. di Otol.* 1934, xlv, 81; <sup>8</sup>*Acta Oto-Laryngol.* 1935, xxi, 4; <sup>9</sup>*Zeits. f. Laryngol.* 1934, xxv, 281.

**LEAD POISONING.** (See LARYNX AND TRACHEA, AFFECTIONS OF;  
TETRA-ETHYL LEAD ENCEPHALITIS.)



**LEPROSY.***Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

Writing on leprosy in England, R. G. Cochrane<sup>1</sup> states that there are believed to be from 50 to 100 cases returned infected from abroad, of which 12 are cared for in a voluntary home in Essex. He agrees that under the modern civilized conditions of this country the disease does not tend to spread, so it is not necessary to make it a notifiable disease.

In the Portuguese West African Colony of Angola H. S. Hollenbeck<sup>2</sup> attributes an increase of leprosy recently to the impoverishment of the people by partial famine conditions that caused scanty rainfall for several years. In 1925 mission treatment was started and was strikingly successful from the first, as all the cases showed marked improvement in the course of a few months, and after eighteen months the early cases were discharged symptom-free. All the patients have been under observation for nine years without any recurrences in those who completed the prescribed course of treatment with bi-weekly intramuscular injections of 0.5- to 4-c.c. doses of sterilized *chaumoogra* oil. Even some advanced nodular cases responded well. The success and popularity of the treatment will permit a large proportion of the cases to be treated when funds are available.

E. Muir<sup>3</sup> explains the difference between neural and cutaneous leprosy, on the basis of the histological findings and the leprolin test, as dependent on the degree of resistance shown by the subjects. He finds a relatively low resistance and cellular response to lepra bacilli in cutaneous nerves as compared with the skin. In another paper the same investigator<sup>4</sup> discusses the factors influencing the spread of leprous infection with the aid of family trees of infected households in Indian villages. He found that out of 17 cases in contact with infectious cases from birth or up to the sixth year, 10 had already themselves become infectious cases and 8 more were uninfected or nerve cases. On the other hand, of 16 cases first coming into contact with infection between the ages of 11 and 25 years, only 1 debilitated subject has become infectious and 8 are uninfected cases. The danger is thus brought out of infectious cases in a house, especially to highly susceptible children, and Muir agrees with the view that if all infectious cases could effectively be isolated from children under ten leprosy would disappear from that community in one or two generations.

REFERENCES.—<sup>1</sup>*Med. Press and Circular*, 1934, clxxxix, Oct. 8, 306; <sup>2</sup>*Trans. Roy. Soc. Trop. Med. and Hyg.* 1935, xxviii, April 17, 655; <sup>3</sup>*Ind. Jour. Med. Research*, 1924, xii, Oct., 383; <sup>4</sup>*Ind. Med. Gaz.* 1934, lxi, Sept., 495.

**LEUKEMIA.** (*See BLOOD DISEASES.*)**LIVER, CIRRHOSIS OF.***H. Letheby Tidy, M.D., F.R.C.P.*

It is now accepted that oedema will develop if the plasma protein falls below a definite level owing to the fact that the osmotic pressure is no longer able to counteract the influence of the blood-pressure in passing fluid through the capillaries. It is also known that in cirrhosis of the liver the plasma protein shows distinct diminution, and it is generally accepted that this is due to the loss of protein from the body in the ascitic fluid. The reduction of plasma protein in cirrhosis is a matter of importance as it not only is the direct cause of the peripheral oedema so often observed but also acts as a vicious circle in increasing the tendency to ascites.

W. K. Myers and C. S. Keefer<sup>1</sup> (Boston), in 16 cases of cirrhosis of the liver without albuminuria, have examined the plasma protein value, the protein contents of the ascitic fluid, and the effects of diet high in protein on the plasma protein level. In accordance with previous observers they found a definite

deficiency in the total plasma protein, the decrease being most marked in the albumin fraction, and the albumin-globulin ratio being inverted. It is of importance to note that in 3 of the 16 cases no ascites was present; in 2 of these there was no peripheral oedema, but the third showed an extensive peripheral oedema without ascites. Control estimation of plasma protein in 14 patients with various disorders of the liver other than ascites showed a distinct tendency to reduction of the plasma protein. The protein content of ascitic fluid varied between 0.1 and 1.71 grm. per 100 c.c. The authors gave high protein diets to a certain number of cases. The investigations were difficult as many patients were unable to take the required amount, but even in those cases in which the diet was well taken, no effect on the plasma protein contents was recognizable, and in one case the total plasma protein fell from 4.6 to 4.2 grm. per 100 c.c. during a period of forced feeding of protein. The authors discuss the cause of the general fall in plasma protein, the loss of protein into the ascitic fluid being accepted as a factor. But in addition to this factor they emphasize two points, first that the diminution of plasma protein may occur in the absence of ascites or oedema, and secondly that the plasma proteins do not rise under a high protein diet, and they suggest that there is a defective formation of blood protein. Evidence of such a defective formation has been found by other observers in cases of liver damage. This is an important though discouraging observation, as a high protein diet might be expected to counteract some of the ill effects of the loss of protein in the ascitic fluid and thus lead to a diminution of the peripheral oedema which is often so distressing to these patients.

REFERENCE.—<sup>1</sup>*Arch. of Internal Med.* 1935, lv, March, 349.

## LIVER, SURGERY OF.

A. Rendle Short, M.D., F.R.C.S.

**Abscess of Liver.**—In a review of 85 cases of liver abscess, all verified by autopsy, at Harvard, Chester S. Keefer<sup>1</sup> demonstrates that the condition is usually the result of infection in the area drained by the portal vein; the cases with and without pylophlebitis are about equal in number. Less common are extensions into the liver from the gall-bladder or bile-ducts, or from other neighbouring organs. The remainder of the cases were due to pyæmia from generalized sepsis. The commonest organisms found were *B. coli*, staphylococci, and streptococci. Multiple abscesses were more often met with than single.

**Cirrhosis of Liver.**—J. E. Strode,<sup>2</sup> of Honolulu, speaks with enthusiasm of omentopexy in the treatment of various forms of cirrhosis of the liver with ascites. Of 8 cases, all but one did well, and several have kept well, without need for further tappings, over a good many years. A right or left rectus incision is made under local anaesthesia, taking care not to injure the round ligament. Omentum is tucked away beneath one or both rectus muscles, spread out as much as possible, and the posterior sheath and peritoneum sewn up, taking care not to strangle the pedicle. One or two further tappings will probably be required.

R. S. Grinnell,<sup>3</sup> of New York, with an experience of 23 cases, speaks much less favourably. Only 2 of these followed up were symptom-free; 7 improved; 7 were not improved; and 6 died. Thus more than half must be classed as failures.

REFERENCES.—<sup>1</sup>*New Eng. Jour. Med.* 1934, July, 21; <sup>2</sup>*Amer. Jour. Surg.* 1935, April, 135; <sup>3</sup>*Ann. of Surg.* 1935, March, 891.

## LUMBAR PUNCTURE. (See CEREBROSPINAL FLUID.)

**LUNG, ABSCESS OF.**

L. S. T. Burrell, M.D., F.R.C.P.

**ETIOLOGY.**—Maxwell<sup>1</sup> records a study of 315 cases of pulmonary abscess found in 11,006 consecutive autopsies. Of these, 199 were single and 116 multiple. He classifies the single abscess as follows:—

- |                 |   |            |  |
|-----------------|---|------------|--|
| 1. Unilocular   | $\left\{ \begin{array}{l} \text{Hilar} \\ \text{Central} \\ \text{Peripheral} \\ \text{Lobar} \end{array} \right\}$ | a. Open to | $\left\{ \begin{array}{l} 1. \text{Bronchus} \\ 2. \text{Pleura} \end{array} \right\}$ |
| 2. Multilocular |   | b. Closed  |  |

Of the 199 cases of single abscess, 149 were unilocular and 50 multilocular. He found that the right lower lobe was involved in 74 out of 120 in which the right lung was involved, and the left lower lobe in 53 out of 79 in which the abscess was in the left lung. In his series there were 3 males to 1 female. These figures as regards site and sex agree with those of other authors. With regard to the causation, Maxwell found that 2 out of the 199 followed tonsillectomy, 32 were associated with carcinoma of the bronchi, 43 with lobar or bronchopneumonia, and 23 followed septic conditions elsewhere.

In the 116 cases of multiple abscess only 2 were associated with carcinoma of the bronchi, 6 with bronchopneumonia, and 62 followed septic conditions elsewhere.

It is remarkable that only 1 per cent of the cases of single abscess followed tonsillectomy, which is usually regarded as one of the most frequent causes of lung abscess. Moore<sup>2</sup> found 202 cases of lung abscess in 450,000 operations on the upper respiratory tract, or about 4 per 9000 operations. Lord<sup>3</sup> found that 49 out of 227 cases of pulmonary abscess followed tonsillectomy. Pinchin and Morlock<sup>4</sup> state that tonsillectomy was responsible for 16 per cent of their cases. On the other hand, Lyman<sup>5</sup> records 20,000 cases of tonsillectomy without one lung abscess. These figures are confusing, but it would appear that after tonsillectomy abscess is more common in adults than in children, and it occurs more frequently in some countries than in others, probably owing to the anæsthetic, and to the fact that in some countries the operation is done with the patient sitting up in a chair.

Whether the abscess is due to aspiration or emboli is a matter of much discussion. Some authorities claim one and some the other as the sole or at least the predominant cause. Some cases are undoubtedly due to emboli, but it is difficult to exclude aspiration as the cause in a considerable number. The facts that after operation on the nose or throat abscess of the lung is definitely more common if a general anæsthetic has been used, that the lower lobe is usually the site of the abscess, that the abscess is so often single, and that it can be produced experimentally in animals by aspiration, give weight to the aspiration theory. It seems that both causes are possible, and a third theory, that the lung is affected through the lymphatics, may be the correct explanation of a few cases.

**TREATMENT.**—In view of the fact that spirochætes are commonly found in cases of lung abscess *arsenical treatment* has been advocated, but in the experience of the author this has been quite ineffective. Maes,<sup>6</sup> however, regards treatment by organic arsenical preparations as almost specific. *Creosote* will lessen the smell and the nasty taste which are such distressing symptoms, but it has no curative effect. Most authors agree that medical measures should be tried first, and of these *posture* is the most important. Nelson<sup>7</sup> has described a special bed which can be raised in the middle so that the patient may have continual postural drainage, and this certainly improves the condition in a large number of patients, and assists a natural cure. Even if cure does not occur, the condition of the patient is often so much improved that any subsequent surgical interference is considerably safer. Lambert and Miller<sup>8</sup> record

14 out of 30 cases cured by posture, and 11 out of 27 cured by *operation*. Morrison Davies,<sup>9</sup> however, gives 55 to 70 per cent mortality in cases treated medically, and 30 per cent in those after operation. In any case there is universal agreement that abscess of the lung has a high mortality whatever the treatment. Treatment itself is dangerous, and the real point at issue is which method will give any particular patient the best chance, or, in other words, which of many dangerous roads is the least risky.

Smith<sup>10</sup> collected 1018 cases from the literature, and found that of 607 cases treated medically 157 recovered and 249 died; 333 had operation, and 110 recovered and 133 died. In the rest there was no material change. This gives a percentage of: 25 per cent recovered by medical treatment; 33 per cent recovered by surgical treatment; 40 per cent died after medical and 40 per cent after surgical treatment.

Brunn<sup>11</sup> reviews 205 cases of acute single lung abscess. He does not include any associated with bronchiectasis, carcinoma, or other gross disease. He says that postural treatment is not so helpful as it is in bronchiectasis, and that it is not without danger in severe cases with cyanosis, high fever, and rapid pulse. He regards bronchoscopy as of value for detection of foreign body or carcinoma, but not as a cure for abscess. Artificial pneumothorax is too dangerous, phrenic crush is useful in certain cases with adhesions to the diaphragm but of limited application. *Operation and drainage* is, in his opinion, the best treatment, not only because it lessens the length of the illness, but also because it gives the best chance of recovery. Of his 205 cases, 133 were treated medically and 72 surgically, with the following results:—

	TOTAL IMPROVED	DIED
Medical (133) ..	63 (47·5%)	70 (52·5%)
Surgical (72) ..	40 (56%)	32 (44%)

He points out, however, that of the 40 patients who recovered after operation, the average time from the first symptom to the date of operation was 415 days, and it was 516 in the case of the 32 patients who died after the operation. He advocates the two-stage operation, the mortality from which was 20 per cent as against 60 per cent in the one-stage operation. The cause of death in his series was as follows:—

	MEDICAL	SURGICAL
Intrathoracic spread	54 (77%)	15 (47%)
Hæmorrhage ..	6 (9·0%)	8 (25%)
Cerebral abscess ..	3 (4·5%)	6 (19%)
Air embolus ..	2 (2·5%)	3 (9%)
Septicæmia ..	3 (4·5%)	—
Heart failure ..	2 (2·5%)	—

These figures bear out the belief that operation increases the risk of cerebral abscess.

Most authorities regard *artificial pneumothorax* as especially dangerous, and modern opinion is against its employment. The writer agrees with this view, but in selected cases he still thinks that it has a place in the treatment of pulmonary abscess. This opinion he holds, not because of the success of artificial pneumothorax, but because of the greater dangers of other methods

of treatment under certain conditions. Of 8 cases of single lung abscess treated by him<sup>12</sup> by artificial pneumothorax, 7 recovered and 1 died. These cases were, of course, selected as those thought suitable for artificial pneumothorax, but in every instance medical treatment had first been tried without success. The most suitable case for this treatment is the deep-seated abscess opening into a bronchus without adhesions to the pleura. Provided there are no pleural adhesions, the danger of pneumothorax is slight, and the deeper the abscess the more dangerous is surgical operation and drainage.

Clerf<sup>13</sup> states that *bronchoscopic treatment* is of value when there is mechanical obstruction to drainage as a result of granulation tissue, inflamed mucosa, or inspissated pus.

Pinchin and Morlock<sup>14</sup> record very satisfactory results in the case of acute abscess by means of bronchoscopic treatment. It should be started early, and must be given a fair trial. In chronic cases their results are also excellent. The majority of authors, however, report results which are not encouraging, although bronchoscopic aspiration undoubtedly has its place in treatment, more especially perhaps to relieve toxæmia and improve the general condition of the patient before he undergoes surgical treatment.

Maxwell,<sup>1</sup> reviewing the literature, quotes many authorities on the value of surgical treatment. Most of them advocate a preliminary trial of medical treatment, but for a short time only. Morriston Davies<sup>9</sup> suggests two months. It is, however, the general opinion that failing a quick response to medical methods surgery is indicated, and with this view the present writer agrees. It is, however, stressed by many authorities that operation early or late is a serious procedure with a high mortality. In chronic cases *lobectomy* or even *pneumectomy* may be necessary, and in the hands of an experienced surgeon this operation is becoming less and less dangerous.

REFERENCES.—<sup>1</sup>*Quart. Jour. Med.* 1934, xxvi, 467; <sup>2</sup>*Amer. Med. Assoc.* 1922, lxxviii, 1279; <sup>3</sup>*Boston Med. and Surg. Jour.* 1925, xciii, 785; <sup>4</sup>*Lancet*, 1930, ii, 842; <sup>5</sup>*Jour. Missouri Med. Assoc.* 1923, xx, 418; <sup>6</sup>*Internal Clin. Philad.* 1926, ii, 197; <sup>7</sup>*Brit. Med. Jour.* 1934, ii, 251; <sup>8</sup>*Arch. of Surg.* 1924, viii, 446; <sup>9</sup>*Surgery of Lung and Pleura*, 1930, London: Humphrey Milford; <sup>10</sup>*Fuso-Spirochaetal Disease*, 1932, London: Baillière Tindall & Cox; <sup>11</sup>*Amer. Med. Assoc.* 1934, ciii, 1999; <sup>12</sup>*Lancet*, 1933, ii, 1414; <sup>13</sup>*New Eng. Jour. Med.* 1934, ccx, 1319; <sup>14</sup>*Lancet*, 1932, ii, 605.

## LUNG, CARCINOMA OF. (See also INTRATHORACIC MALIGNANT TUMOURS.)

L. S. T. Burrell, M.D., F.R.C.P.

INCIDENCE.—The incidence of this disease has shown a definite increase during recent years. M. Davidson<sup>1</sup> quotes figures showing that this increase appears to be universal, and is too large to be accounted for by improved diagnosis. At the Brompton Hospital, 16 per cent of all autopsies in 1918 and 29.6 per cent in 1929 were due to intrathoracic tumours, and 47 patients were admitted with intrathoracic growth in 1929 as against 7 in 1918. Levy Simpson<sup>2</sup> records carcinoma of the lung as accounting for 0.65 per cent of all autopsies in 1918 and 2.05 per cent in 1925 at the London Hospital.

Sears,<sup>3</sup> in a more recent review, confirms this increase in incidence, and gives details of 26 cases, of which 23 were male and 3 female. The average age was 55, and the average duration of the disease was six months, the longest being fourteen months in his series. He states that of the pulmonary symptoms a dry cough was the most consistent, sputum appeared later, and in 5 cases only was it blood-stained, and none had the so-called prune-juice appearance. One had a terminal hæmorrhage. Dyspnoea was a common and early symptom. Pain due to pleurisy was present in 13 of his series. Loss of weight was not an important feature, and 6 lost no weight at all. In several cases the initial symptoms are not connected with the respiratory

system but are due to metastases. The brain is commonly affected, and the first symptoms may be those of cerebral tumour. Bones and the liver are also common sites for secondary growth from lung carcinoma.

**Diagnosis.**—Diagnosis may be made by bronchoscopic examination, and in doubtful cases a piece of the growth can be removed for microscopical examination. Jackson and Konzelmann<sup>2</sup> report 32 cases where the diagnosis was made in this way. They point out the importance of getting actual growth tissue for biopsy, for granulations form around the growth, and pieces of these will not show evidence of growth tissue.

Dudgeon and Wrigley<sup>3</sup> have done important work on the demonstration of particles of malignant growth in the sputum by the wet-film method. In 68 per cent of 58 cases they were able to diagnose carcinoma from examination of the sputum, and in the majority of these they could actually tell the histological type of growth present.

**Treatment.**—Radium is not satisfactory. Radon seeds may give temporary relief and prolong life, but they may make matters worse by setting up a mediastinitis. Treatment by X rays is quite useless, and the only method that offers any hope is *lobectomy*. This is very rarely possible, as in the great majority of cases symptoms do not appear until the growth has reached the inoperable stage. In two cases, however, the writer has seen carcinoma successfully removed by lobectomy, and in both the diagnosis was made by X rays before other signs had appeared.

**REFERENCES.**—<sup>1</sup>*Cancer of the Lung*, 1930, Bristol, John Wright and Sons; <sup>2</sup>*Quart. Jour. Med.* 1928, xxii, 413; <sup>3</sup>*Clinical Jour.* 1934, lxiii, 328; <sup>4</sup>*Jour. Amer. Med. Assoc.* 1935, civ, 686; <sup>5</sup>*Jour. Laryngol. and Otol.* 1935, l, 752.

## LUNG, RADIOGRAPHY OF. (See also X-RAY DIAGNOSIS.)

L. S. T. Burrell, M.D., F.R.C.P.

Kerley,<sup>1</sup> discussing the differential diagnosis between Assmann's focus and other pulmonary conditions, says that the most likely lesions to simulate Assmann's focus are: (1) Abscess; (2) Primary carcinoma; (3) Secondary carcinoma or sarcoma; (4) Pulmonary thrombosis; (5) Hydatid cyst; and (6) Interlobar empyema. Pulmonary thrombosis complicating heart disease is not often difficult to recognize, but it is by no means uncommon to find a pulmonary thrombosis either associated with thrombosis of the femoral or some other vein, or occurring apart from thrombosis elsewhere and producing symptoms which are entirely pulmonary. This is a manifestation of thrombophlebitis migrans, and when the lung is involved the symptoms are pain in the chest, dyspnoea, mild pyrexia, slight cough, and often a little hæmorrhage. The X-ray appearance of a small thrombosis in the lung is a small rounded opacity, most often in the infraclavicular region, and closely resembling Assmann's focus. A large thrombosis produces an ill-defined opacity occupying the greater part of a lobe. Pulmonary thrombosis tends to clear up rapidly, whereas in tuberculosis there is slow evolution, so that serial X-ray examinations will often clear up the diagnosis. A hydatid cyst is always sharply defined, and shows a shadow larger and more dense than Assmann's focus, and usually situated in the lower lobe.

*Beck's sarcoid*, though first described in 1897, still causes controversy, but the majority of opinions regard it as a reaction to tuberculosis. Hollander and Schlesinger<sup>2</sup> describe four cases, and think the condition should be regarded as tuberculous. Radiography may show a diffuse infiltration in the middle zones of the lungs and heavy hilum shadows. The X-ray appearances, however, are certainly not those usually associated with tuberculosis. Kissmeyer<sup>3</sup> regards it as a non-tuberculous but specific chronic granulomatous condition.

He discards tuberculosis because of the rareness with which tubercle bacilli have been found, the fact that the tuberculin reaction is usually negative, the heavy hilum shadows as seen by radiography are not suggestive of tuberculosis, nor are the bony changes in the phalanges of the fingers and toes. He thinks that *potassium arsenite* has almost a specific action, and this would not be expected if the condition were tuberculous.

REFERENCES.—<sup>1</sup>*Brit. Jour. Tuberc.* 1935, xxix, 19; <sup>2</sup>*Arch. Dermatol. and Syph.* 1934, xxix, 387; <sup>3</sup>Levin and Munksgaard, Copenhagen, 1932.

### LUPUS ERYTHEMATOSUS. A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

K. Steiner<sup>1</sup> recommends the combined use of *arsenic and gold* in the treatment of lupus erythematosus. The treatment consists in the administration of Fowler's solution by the mouth, given in doses beginning with 3 min., three times a day, and rising rapidly (1 min. daily) to 15 to 20 min. The drug is pushed with the deliberate intention of producing an arsenical reaction of the skin, after which the drug is stopped. Intramuscular injections of gold, in the form of an oily suspension of solganol B, are given when the maximum doses of arsenic have been administered, either before or after some reaction has appeared. The initial dose of solganol B is 0.002 gm. and the maximum 0.06 gm. Some 12 to 15 injections may be required, the interval between the injections being five to seven days. The author has treated 19 cases by this method; of these, 14 were cured and had remained free from recurrence for periods varying from two to ten months. Of the remaining 5 cases, 2 improved but were not completely cured, while 3 were refractory to the treatment. The author attributes the success of the treatment to the action of the arsenic on the capillary wall, causing changes which allow the entry of the gold salts into the tissues.

REFERENCE.—<sup>1</sup>*Wien. klin. Woch.* 1934, xlvii, Aug. 17, 1019.

### LYMPHADENOMA. (See BLOOD DISEASES.)

### LYMPHŒDEMA.

Ivor J. Davies, M.D., F.R.C.P.

E. V. Allen<sup>1</sup> (Rochester, Minn.) presents a study of 300 cases of lymphœdema of the extremities observed at the Mayo Clinic. The following classification is adopted:—

#### A. NON-INFLAMMATORY.

1. Primary.—						Cases
Precox	..	..	..	..	..	93
Congenital—						
Simple	..	..	..	..	..	12
Familial (Milroy's disease)	..	..	..	..	..	0
2. Secondary.—						
Malignant occlusion	..	..	..	..	..	32
Surgical removal of lymph nodes	..	..	..	..	..	61
Pressure	..	..	..	..	..	1
Röntgen and radium therapy	..	..	..	..	..	3

#### B. INFLAMMATORY.

1. Primary (single or recurrent acute and chronic)						41
2. Secondary (single or recurrent acute and chronic)—						
Venous stasis	..	..	..	..	..	13
Trichophytosis	..	..	..	..	..	5
Systemic diseases	..	..	..	..	..	5
Local tissue injury or inflammation	..	..	..	..	..	34

Descriptions are given of the various types of lymphœdema and the mechanism of production is reviewed. This is a valuable contribution dealing with a somewhat obscure and common condition and worthy of close consideration.

REFERENCE.—<sup>1</sup>*Arch. of Internal Med.* 1934, liv, Oct., 606.

**LYMPHOGRANULOMA INGUINALE.** Col. L. W. Harrison, D.S.O.

**EXPERIMENTAL.**—C. Levaditi, P. Mollaret, and L. Reinié<sup>1</sup> have carried out a number of experiments to prove conclusively that in certain forms of ulcerovegetative ano-proctitis and of rectal stricture the virus of lymphogranuloma inguinale is actually present in the bowel wall or the vegetations and that these conditions are not due merely to lymph-stasis. With material obtained through a colostomy wound from a case of recto-colitis they inoculated guinea-pigs, and from these passaged the virus through monkeys to mice, with positive results. They report characteristic symptoms with changes in the glands and rectum of monkeys inoculated with the material and illustrate these in a number of figures. They conclude by reporting on the results of inoculating two men suffering from G.P.I. with virus of the same origin after it had passed through two monkeys. In the first case 0.5 c.c. of the virus was inoculated into the base of the prepuce. A smart local reaction followed, and this died away in two days, but twelve days later a small collection of pus appeared at the site, and at the same time double inguinal adenopathy, the Frei skin reaction, previously negative, now being positive to two antigens. In the second case 1 c.c. of the virus was inoculated close to a right inguinal gland. Ten days later the gland swelled, and the Frei reaction, previously negative, was now found to be positive to two antigens. Inoculation of monkeys and mice with pus from the first of these cases produced the usual effects of lymphogranuloma inguinale virus. Further, the serum of one inoculated man showed in due course (forty-one days after inoculation) the same virulicidal properties as did that of a natural case of lymphogranuloma inguinale against, respectively, ordinary lymphogranuloma inguinale virus and the virus used in these experiments. Thus, the authors say conclusive proof has been furnished that the vegetations in certain forms of ano-proctitis contain the virus of lymphogranuloma inguinale.

**EPIDEMIOLOGY.**—The ubiquity of lymphogranuloma inguinale continues to be testified by reports of cases from every part of the world. Many of these show that the disease has long gone unrecognized in the reporters' hospitals and owes its disclosure there to the publicity given to the subject during the past few years. This is shown by the following. In a Lennander Lecture by S. Hellerström and E. Wassén,<sup>2</sup> Hellerström suggested that the disease had really existed in Europe much longer than may at first be thought—in fact, that some of the buboes described by John Hunter (1786) as scrofulous and by William Wallace (1798-1837) as "indolent primary syphilitic bubo" were probably examples of lymphogranuloma inguinale. It is, of course, only since the introduction of Frei's skin test in 1925 that our knowledge of the epidemiology of lymphogranuloma inguinale and its relations to other affections (e.g., esthiomène) has become at all accurate. In order to obtain an idea of the prevalence of lymphogranuloma inguinale Hellerström in 1932 sent a questionnaire to about 350 dermatovenereal clinics and received information respecting 1636 cases of the disease plus about 215 of esthiomène from 150 clinics and private practices. The result showed the wide distribution of the disease and yet its irregularity. In Malang, Java, from 1929 to 1932 there had been no fewer than 272 cases of lymphogranuloma inguinale, all confirmed by Frei's test, in a garrison of 2750 men. Hellerström cites as further evidence of the great prevalence of lymphogranuloma inguinale in these parts a report by Gibson that 1 per cent of the crews of ships of the British Navy stationed in Chinese waters suffer from it. He gives a comprehensive table showing numbers of cases dealt with in a number of clinics in different European countries, and in this the irregularity of distribution is evident. He comments on the comparative rarity of the disease in England and Russia, and its frequency in



Sweden, France (chiefly Paris and Lyons), Spain, and certain clinics in Germany.

L. A. Gillin,<sup>3</sup> having had a case of lymphogranuloma inguinale in his own service and his attention drawn to one case of rectal stricture and one of bubo in the same (Boston City) hospital in the previous two years, looked up the records of the hospital and came to the conclusion that in the ten years ending Jan. 1, 1935, the hospital must have dealt with 81 cases of infection with the virus of lymphogranuloma inguinale, or poradenolymphitis, as, following Stannus, he prefers to call it. They were made up of benign rectal stricture, 12; elephantiasis of genitals or genitals and extremities, 4; inguinal buboes, 65. Of the 81 patients, 13 were coloured and 68 white. C. C. Chesterman<sup>4</sup> describes a number of cases of lymphogranuloma inguinale or poradenolymphitis and of esthiomène in patients from the district between Stanleyville and Basoko (Belgian Congo) who were dealt with at the Baptist Mission at Yakusu. Such cases had been seen since 1920, but their true nature was not suspected until the author's attention had been directed to the possibility of their being lymphogranuloma inguinale by Stannus's writings.

O. Just,<sup>5</sup> in a critical review on 'climatic bubo' based on 28 cases observed in the German Navy from 1924 to 1932, thinks this name more suitable than 'lymphogranuloma inguinale' because the latter is apt to be confused with granuloma venereum, and, moreover, the disease is histologically anything but a lymphogranulomatosis. He quotes a work by Klotz in 1890 which described under the term 'strumous bubo' the disease we know as 'climatic bubo'. With regard to modes of infection, besides the venereal, the author quotes the cases, reported by Lujan and Rotter, of two girls aged respectively 6 and 7 years who were infected through sleeping in the same bed as a sufferer from the disease.

DIAGNOSIS.—L. Lichtenstein and E. von Haam<sup>6</sup> have found emulsion of brains of mice and of monkeys infected with lymphogranuloma inguinale quite reliable for Frei's skin tests. The first inoculation is with pus from an acute inguinal bubo in a patient who gives a positive Frei reaction. Of the emulsion in saline 0.1 to 0.2 c.c. are injected intracerebrally in the case of white mice and 0.2 to 0.3 c.c. in monkeys (the common marmoset was used). The mice are killed at the end of a week; the monkeys are allowed to die. Of the brain a 20 per cent emulsion is made; it is heated at 60° C. for two hours on one day and for one hour the next. Monkey-brain antigen was used in 300 tests and mouse brain in 150 tests, with uniformly satisfactory results. The method has the advantage of eliminating contamination by other micro-organisms and the false positive reactions occasionally obtained with bubo pus.

W. E. Coutts and T. Ponce<sup>7</sup> report in more detail on the technique of a complement-fixation test for lymphogranuloma inguinale (see *MEDICAL ANNUAL*, 1935, p. 259). Intact excised glands from a case of lymphogranuloma inguinale that is negative to syphilitic and soft chancre tests are minced with 0.5 per cent carbolic (1 grm. per 10 c.c.). The mixture is shaken for thirty minutes and centrifugalized for ten to twenty minutes, after which the supernatant fluid is pipetted off and placed in the water-bath at 56° C. for one hour. Determination of the correct amount of antigen to use in the test and the other details follow well-recognized principles of complement-fixation tests. The antigen is used in three different amounts, the other reagents being constant. No false positive has been found in over 100 controls when employing dilutions of antigen ranging from 1-50 to 1-250. The authors give a table showing the reactions in 26 cases. It shows 8 negative reactions in cases where the duration of the disease was, except in two cases, only eight to twenty days. In the positive cases the duration of the infection appears to have ranged from twenty days to five years.

E. Reiss<sup>9</sup> has elaborated a skin test on the hypothesis that lymphogranuloma inguinale antigen circulates in the blood of patients during the earlier stages of the disease, the second or third week. The blood serum of such cases was mixed with 0.5 per cent phenol and stored in the ice-chest. In six cases of lymphogranuloma inguinale it was found without exception that the intracutaneous injection of: (1) 0.5 per cent phenol caused no reaction; (2) Frei antigen and serum obtained as above, respectively, produced a reaction; and (3) Frei antigen plus serum as above produced a greater reaction than did either of these agents alone. From this the author infers that the serum of patients with lymphogranuloma inguinale in the early stage contains antigen. At this stage also the serum evidently does not contain antibody, because, unlike the case later, it does not neutralize Frei antigen; on the contrary, it enhances its action.

TREATMENT.—C. I. Mihaiesi, S. Longhin, and B. Wisner<sup>9</sup> have tested a vaccine made of emulsion of the organs of monkeys infected with lymphogranuloma inguinale and killed on the twentieth to twenty-fifth day after inoculation. Each emulsion (1 of organ in 10 of saline) after sterilization by heat for one hour at 56° C. on each of three days was tested by being used in a Frei test on a case of lymphogranuloma inguinale, and those affording positive Frei reactions were mixed. The vaccine so prepared was given in a dose of 1.5 c.c. every two days. From November, 1932, to June, 1934, it had been employed in the treatment of 180 cases of benign lymphogranuloma inguinale. Most of the cases were afebrile, but in 40 the temperature was from 38° to 40° C. There were 137 adenopathies, 34 suppurating and fistulous, 5 cervical, 2 inguinal with elephantiasis of the lower limbs, and 2 cases of arthralgia. Besides there were 4 cases of ano-rectal lymphogranulomatosis, in one of which the vaccine treatment was followed by cure, and in two by improvement. The results in the ordinary glandular cases are reported to have been good. The number of injections necessary for cure varied with the age of the infection but averaged 10 to 20. The earlier injections in 20 of the cases caused a definite focal reaction in the shape of increase of size of the glands and of the suppuration. The authors maintain that the action of the vaccine is specific as it has no effect on other adenopathies. They say the results cannot be attributed to a pyrogenic effect as the vaccine only rarely causes fever.

R. V. Rajam<sup>10</sup> reports excellent results from the treatment of lymphogranuloma inguinale with the trivalent antimonial compound, *fouadin*.

[I have so far found no treatment more efficacious than intravenous injections of *dmelcos*. In one case in which the sole manifestation was in the anal canal which had been treated by numerous remedies for over a year without result, cure was effected in about three weeks by intravenous injections of *dmelcos* supplemented by iodoform suppositories.—L. W. H.]

REFERENCES.—<sup>1</sup>*Bull. Acad. de Méd.* 1935, cxiii, 439; <sup>2</sup>*Epidemiology and Etiology of Lymphogranuloma Inguinale*, reprinted from a Commemorative Volume published in honour of Prof. Cantacuzène, 1934, Paris, Masson et Cie; <sup>3</sup>*New Eng. Jour. Med.* 1935, ccxii, 1209; <sup>4</sup>*Ann. Soc. belge de Méd. trop.* 1934, xiv, 413; <sup>5</sup>Thesis for Doctorate Christian Albrecht's University, Kiel; <sup>6</sup>*Proc. Soc. Exper. Biol. and Med.* 1935, xxxii, 952; <sup>7</sup>*Jour. Lab. and Clin. Med.* 1935, xx, 629; <sup>8</sup>*Arch. Dermatol. and Syph.* 1935, xxxi, 215; <sup>9</sup>*Comptes rend. Soc. de Biol.* 1934, cxvii, 292; <sup>10</sup>*Ind. Med. Gaz.* 1934, lxi, 372.

*Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

A good clinical study of this disease is recorded by R. V. Rajam<sup>1</sup> based on an experience of 193 cases at the Madras Venereal Clinic, 168 of which were in males. The majority were between the ages of 20 and 30 years, and the average incubation period after exposure to infection was seven to ten days. A small evanescent papular primary lesion is followed by enlargement of the

inguinal glands, often extending to the iliac ones, although the latter rarely suppurate in the way the inguinal ones do in many cases to leave induration and sinuses. Low fever and moderate leucocytosis mark the constitutional stages during the first week or two. A positive Frei reaction is of great diagnostic value, and the prognosis is good except in cases with anorectal ulceration followed by fibrous stricture of the rectum 2 to 6 cm. from the anus, which is liable to be mistaken for a syphilitic condition. *Protein shock*, followed by *fouadin* injections, are advised in unbroken climatic bubo, and aspiration if there is fluctuation, or partial removal of infected glands, to lessen the risk of subsequent lymphatic obstruction.

The experimental transmission of lymphogranuloma inguinale to guinea-pigs is dealt with by W. E. Coutts and J. M. Herrera,<sup>2</sup> who claim to have produced in those animals a condition clinically resembling the human inguinal disease after passage of the virus through the brains of white mice and rabbits.

REFERENCES.—<sup>1</sup>*Ind. Med. Gaz.* 1934, lxi, Oct., 546; <sup>2</sup>*Jour. Trop. Med. and Hyg.* 1935, xxxviii, March 1, 53.

### LYMPHOGRANULOMA OF STOMACH. (See STOMACH, LYMPHOGRANULOMA OF.)

### MALARIA.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

EPIDEMIOLOGY AND PROPHYLAXIS.—The epidemic of malaria in Ceylon in the cold season of 1934-5 has been described by V. B. Wigglesworth<sup>1</sup> from personal experience. As usual it was caused by exceptional climatic conditions, in this case rainfall that was too deficient to flush out the innumerable breeding-places in 300 miles of the lower portions of a mountain stream, which made it physically impossible to control the excessive development of the dangerous malaria carrier, *Anopheles culicifacies*. When it was evident that the south-west monsoon rains of 1934 had failed, a warning was issued of the approaching epidemic and a most efficient organization brought treatment within the reach of every village of the 5000 square miles affected by the outbreak. Some increase in the fever death-rate occurred, for, as shown by S. de Silva,<sup>2</sup> there were very numerous dangerous cerebral, bilious, and algid intestinal forms in the overcrowded hospitals, and 95 per cent were due to the malignant tertian parasite. The algid cases showed very low blood-pressure, and intravenous quinine was often followed by death, although adrenalin helped. [He does not appear to have used intravenous quinine acid hydrobromide, as done successfully by the reviewer, in these cases, and reported in the *Indian Medical Gazette*, 1917, p. 385.] The influence of meteorology on the incidence of malaria has also been studied at Pietermaritzburg by C. C. P. Anning,<sup>3</sup> where the disease has increased in recent years. Eighty per cent of the cases occurred within a quarter of a mile of water courses within the borough, and in 1933 extensive drainage and anti-mosquito measures reduced the incidence. The seasonal incidence showed that the increases of the disease only occurred when the mean temperature exceeded 60° F. with full development of the parasites in the *A. costalis*.

The incidence of malaria in Nyassaland has been investigated by J. G. Thomson,<sup>4</sup> where the carriers are *A. funestus* all the year round, and *A. gambiae* in the rainy season when the disease is most prevalent. Out of 103 children examined monthly for a year, 99 showed infection, nearly all by the M.T. form, which was also the most prevalent one in adults, and a frequent cause of still-births and abortions, and this renders prophylactic quinine advisable during pregnancy, and also in Europeans to prevent the prevalent blackwater fever, from which some 32 attacks occurred in 1895 among only 275 whites.

Malarial control under the difficult conditions in rural Bengal is described by H. G. Winter,<sup>5</sup> with Government aid to the Malarial Committees and Anti-malaria Co-operative Societies. Surveys are done and plans worked out for drainage, mass treatment to sterilize the human carriers by cinchona febrifuge and plasmochin, and filling up tanks and borrow pits. At the new north-east coast Indian port at Vizagapatam, K. Satyanerayana<sup>6</sup> reports that reclamation of low-lying swampy ground and oiling and Paris green for destroying mosquito larvae are mainly relied on. J. A. Sinton and S. A. Mujid<sup>7</sup> have investigated larval destruction in sluggish streams, and they found the relative failure of the application of Paris green applied every five days to destroy them was due to large numbers floating down from higher untreated areas, and this was only partially prevented by the use of a floating boom across the stream. K. Lindberg<sup>8</sup> has recorded a careful survey of malarial conditions along the Barsi railway in the Bombay Presidency, where preventive measures are so difficult that he recommends prophylactic treatment and education of the masses in the hope of some future benefit. P. Sen<sup>9</sup> reports on the relative incidence of eight varieties of anopheles, including three malarial carriers, in rice fields near Bengal villages. The proportions were variable, and one village with highly saline water escaped malaria. The drainage of an Assam swamp into a neighbouring stream is described by C. Strickland and D. Gibson,<sup>10</sup> and the spleen rate of a tea estate was found to be lower subsequently in 1934 than it had been recorded to be eleven years earlier. In another group of tea gardens, drainage, together with silting up of other shallow collections of water and oiling breeding-places, are reported by R. A. Murphy<sup>11</sup> to have had very beneficial results, including a reduction of the sickness rate on one garden from 19.6 per cent in August to 2.5 per cent later.

Trapping mosquitoes is reported on by J. F. James<sup>12</sup> in the Indian cantonment of Nasirabad. All the windows of a barrack except one were darkened, and over that one a piece of black cloth was placed with an aperture 6 to 8 in. in diameter leading into a mul-mul bag. On burning pyrethrum in the room all the mosquitoes fly out of the lighted window into the bag, a barrack of over 10,000 cubic feet being thus cleared of them in half an hour at the cost of one farthing. About 15,000 anophelines were thus caught, about two-thirds being potential malaria carriers, together with sand-flies, etc.

Malaria in the Sind Province of North-west India, including areas irrigated by the Indus Lloyd Barrage, is reported on by G. Covell and J. D. Baily.<sup>13</sup> The disease was very prevalent, with 35 to 44 per cent of the people showing enlarged spleen in the Nawabshah District. In Larkana town the high incidence is considered to be "chiefly, if not entirely, due to the conditions brought about by the operation of the Lloyd Barrage scheme." Malignant tertian cases showed a single autumn peak, but benign tertian showed an additional spring rise, and this is attributed to primary infections acquired in the previous autumn. G. Covell and V. Prasad<sup>14</sup> also report on the use of Paris green in a hyperendemic Sind village, where partial success in the first two years was followed by failure in the next two, attributed to deterioration due to the irrigation scheme. Even a reduction of 80 per cent in the malaria-bearing anopheles left a spleen-rate of over 80 per cent, and the authors conclude that "the control of malaria in hyperendemic areas of India is not likely to be achieved by antilarval measures under the present conditions". The cost of continued skilled supervision makes these measures impracticable except where there are a large number of villages close to the headquarter town with passably good roads. Dusting Paris green over rice fields appears to be harmless except in the early morning when the flowers are open.

An attempt to control the incidence of malaria in Panama by systematic treatment of all cases with *atebrin* and *plasmochin* is reported by W. H. W. Komp and H. C. Clark<sup>15</sup>, who have worked in five malarious villages with one for a control for four successive years. Various combinations of the two drugs and of quinine were used, but none proved particularly successful in reducing the malarial rate, except possibly the combination of *atebrin* and *plasmochin*. Monthly surveys show cyclical variations extending over several years, which makes control difficult. Their work has, however, reduced the number of chronic infections and improved the general health.

CLINICAL.—Further light has been thrown on Henry's *melanin reaction in malaria* by the observation of R. H. Wiseman<sup>16</sup> to the effect that precipitation of malarial sera takes place equally well in the absence of melanin when 0.2 c.c. of the serum are added to 2 c.c. of distilled water, and all that melanin does is to stain the precipitate, which he suggests is euglobulin. Shortly afterwards E. W. D. Greig, E. B. Hendry, and C. E. van Rooyen<sup>17</sup> confirmed this observation and stated that the precipitate is euglobulin, which R. Lloyd had previously shown to be in excess in the sera of both malaria and kala-azar; but the above writers think some other factor must be present as the reaction is not given by the blood of syphilitics, although they have an excess of euglobulin.

Two further examples of direct malarial infection through syringes used without disinfection by a succession of drug addicts have been reported by J. A. Bradley<sup>18</sup> from New Orleans, and by M. Helpert<sup>19</sup> from New York City. W. Broughton-Alcock<sup>20</sup> records, as the result of years of laboratory work on war pensioners, that malarial parasites do not remain in the blood for more than five years after return home. D. B. and M. E. Wilson<sup>21</sup> report finding 27 Africans of Tanganyika infected with *Plasmodium ovale* during a survey of untreated persons. R. Kirk<sup>22</sup> records a case of intra-uterine malarial infection. The status of the *P. ovale* is considered by A. Glovarola,<sup>23</sup> who maintains that *P. vivax* as seen in chronic infections and in inter-human passages is practically indistinguishable from the usual descriptions of *P. ovale*, so the latter cannot be accepted as a fourth human plasmodium.

TREATMENT.—*Atebrin* continues to find favour in the treatment of malaria, and a short trial of a new compound, *atebrin musonate*, is reported from Ceylon by J. R. Blaze and A. T. W. Simcons<sup>24</sup>; this can be injected either intramuscularly or intravenously, preferably by the former method. In 8 patients a single intramuscular dose of 0.3 gm. failed to control the fever in 2, and had only a temporary effect in 2 more, and in another there was a parasite relapse. Of 9 patients who received two such intramuscular doses with an interval of twenty-four to thirty-eight hours the fever was controlled in one to three days in all but one, who required a further dose for parasite relapse, so the immediate results were good in both B.T. and M.T. cases, but they could not be followed up to determine the relapse rate. Toxic symptoms were less evident than after oral use of *atebrin dihydrochloride*, and the amount of the new drug used was less, so the results appear to be promising. *Atebrin musonate* is a soluble yellow powder supplied in dry ampoules containing 0.125 gm., corresponding to 0.1 gm. of the dihydrochloride. The price is not mentioned. E. P. Hicks<sup>25</sup> reports that a single dose of *atebrin musonate* was not injurious to the tissues of monkeys on injection into muscle, and it appeared to be more quickly absorbed than by the oral route.

The toxicity of synthetic antimalarial remedies is reported on by R. N. Chopra and R. N. Chaudhuri,<sup>26</sup> who warn against either *atebrin* or *plasmochin* being continued for long or used without direct medical supervision. Ten cases with toxic symptoms are described; these include the minor effects

after atebirin of yellow staining of the skin and gastric pain, and more severe ones after plasmochin, including blackwater-fever-like symptoms, tachycardia, and in one myocarditis. Atebrin treatment among Bengal railway employees is reported on by C. R. Newman and B. S. Chalam,<sup>27</sup> who agree with the views of R. N. Chopra above as regards toxicity, which they think is increased by combining the two synthetic drugs, so they advise atebirin for five days, followed by small doses of plasmochin for another five days to destroy the sexual stages of the parasites. Atebrin usually stops the fever in twenty-four hours and reduces the spleen rapidly, and owing to the smaller dosage is on the whole less expensive than quinine. The prophylactic and curative effects of atebirin and plasmochin have been tested on a tea garden by D. P. Williams and R. Bhattacharyya.<sup>28</sup> Prophylactic doses of 3 gr. of atebirin in adults every day with the evening meal for five days, followed by  $\frac{1}{2}$  gr. of plasmochin twice a week from July to the end of November, with proportionate doses in children, were given in a highly malarious area to a population of 234 persons at a cost of £75. Subsequently 50 cases of malaria, or 21.36 per cent, occurred, mostly in children, and although the rate was diminished to some extent, especially of the malignant tertian type, it was not considered that the results obtained compensated for the expense and trouble incurred. In a heavy malignant tertian infection atebirin was given orally by R. N. Chopra and B. Sen<sup>29</sup> with as good results as with quinine. Clinical tests of atebirin controlled by parasite counts made from blood films are reported by F. M. Peter.<sup>30</sup> He concludes that the drug is an efficient and rapidly acting remedy against the sexual stages of the malarial parasite.

A. N. Kingsbury<sup>31</sup> reports on *psychoses in cases of malaria treated by atebirin*, with seven mild cases of one to seven days' duration and four more serious cases requiring institutional treatment, among several thousand malarial cases so treated. Two of the severe cases had bad previous personal or family histories, so were predisposed to nervous trouble, and the malarial toxins set free by destruction of the parasites may be the cause, but the indication is to give the new drug with caution in such predisposed subjects.

A new *qualitative and quantitative test for atebirin in the urine* is described by R. C. Wats and B. N. Ghosh.<sup>32</sup> It consists in shaking up 100 c.c. of the urine, previously rendered alkaline by 10 grm. of potassium carbonate, with 20 c.c. of amyl alcohol. On pouring off the latter it will show the typical yellow colour, confirmed by finding a green fluorescence on examining it with a lens in bright sunlight against a black background if up to 1-10,000,000 atebirin was present in the urine. By comparing the fluorescence with those of standard solutions of atebirin a quantitative result can be obtained.

*Quinine.*—The best method of using the cinchona derivatives is still the subject of much discussion. The action of quinine in bird malaria due to the *P. cathemerium* has been investigated by E. M. Lourie,<sup>33</sup> who concludes that when the acute stage of infection is aborted by the use of quinine, just as strong immunity results as when the disease is allowed to run its course, contrary to the contention of those who think that early quinine treatment of human malaria interferes with the acquirement of immunity; but the writer admits that immunity follows the canary infection much more quickly than in human *P. vivax* ones. In a study of the mode of action of quinine bihydrochloride in canary infections Lourie found it produced a profound interference with the normal growth and reproduction of the malarial parasites, with delayed sporulation and a smaller number of merozoites during division, together with upsetting of the synchronicity of the asexual cycle. These changes indicate a direct *in vivo* action of the drug or its derivatives on the parasites such as is not found by *in vitro* tests, and it is suggested that this

may be due to long-continued action of small circulating amounts of the drug. He also found that a comparative study of the effects of quinine on two strains of *P. relictum*, from New York and Germany respectively, showed considerable differences. The action of quinine in different concentrations on monkey malaria caused by *P. knowlesi* is reported on by R. N. Chopra and others.<sup>34</sup> They found no definite relationship between the concentration of quinine in the blood and the parasite count, so in this animal infection they were unable to demonstrate any direct action of the drug, and they suggest that it is "synergistic to the other mechanisms set up in the body". Estimations of the amount of quinine in the blood of monkeys and of man after various methods of administration have been made by R. N. Chopra and others<sup>35</sup> by the method of Vedder and Mason. They found quinine acid hydrobromide, given either intramuscularly or intravenously, reached its maximum concentration in both methods after fifteen minutes and then gradually fell, somewhat more quickly after intravenous injection, to disappear nearly or completely after twenty-four hours. By the oral route the results were very similar, except that during the first few hours the concentration in the blood is sometimes much smaller and varies more with the digestive conditions. The oral route is thus the method of choice, and in view of the injuries to blood-vessels and tissues the parenteral route is not justified as a routine measure. H. Williamson and S. Singh<sup>36</sup> come to a similar conclusion from clinical experience, and reserve intramuscular injections, not exceeding four, for failures of oral administration. On the other hand, S. Subrahmanyam<sup>37</sup> reports on the intravenous route in 300 hospital cases, and he gives adrenalin if the blood-pressure falls greatly. He claims that it is cheap and effective. Once more D. Manson<sup>38</sup> advocates the use of the intramuscular route, after personal experience of it, in all cases with obstinate vomiting, hyperpyrexia, and intense headache, but the intravenous one in heavy malignant tertian and cerebral cases.

The clinical value of *totaquina* and *quinine* respectively has been found by E. P. Hicks and D. Chand<sup>39</sup> to be equal.

J. W. Field and M. Kandiah<sup>40</sup> point out that in using Mayer's reagent in testing urine for quinine the latter should first be acidified if alkaline.

A trial in monkey malaria of *tebetren*, in which quinine is combined with an acridine dye and united with a bile-salt to render it less toxic, is reported on by R. N. Chopra and S. G. Gunguli,<sup>41</sup> who found it to be "fairly efficacious" by intramuscular and intravenous injection in doses of 3 to 6 gr. daily for two or three days. It is said to combine the action of quinine and atebren, and it is being tried in human cases.

**Blackwater Fever.**—The suggestion of Blacklock and Macdonald that this complication of malaria is related to contraction of the spleen is supported by A. D. Charters<sup>42</sup> on the basis of a study of fifteen cases. He notes that a well-marked reduction in the size of the spleen occurs during the course of the disease, severe attacks of which are associated with previous great enlargement of the organ. He states that the exciting causes are mainly those which result in stimulation of the sympathetic nerves, including quinine, so he suggests producing splanchnic anaesthesia of a temporary nature with novocain, or more permanently by an abdominal operation, or by injection of the nerves with alcohol.

Hæmoglobinuria in malarial infected monkeys has been studied by K. V. Khrisan and B. M. Ghosh,<sup>43</sup> who found that when the reticulo-endothelial system is depressed, as evidenced by a low such cell count and inability to take up large quantities of the vital dyes, sudden severe hæmolysis results in hæmoglobinuria. Further, removal of the spleen of monkeys infected with the

virulent *P. knowlesi* intensifies the infection and liability to hæmoglobinuria, and quinine is unsatisfactory in its treatment.

In a highly technical paper N. H. Fairley and R. J. Bromfield<sup>44</sup> describe a new blood pigment found in cases of blackwater fever resembling methæmoglobin spectroscopically, but not reduced by Stokes' reagent or ammonium sulphide. Hyperbilirubinæmia and hypercholesterolæmia were also noted, together with a constant decrease in the alkali reserve, and acidosis of a renal nature may end fatally.

The reticulocytes in blackwater fever have been found by W. K. Blackie<sup>45</sup> to rise to a maximum at the termination of the hæmolytic phase, and a rapidly rising count is of good prognostic value.

REFERENCES.—<sup>1</sup>*Brit. Med. Jour.* 1935, i, March 23, 590; <sup>2</sup>*Jour. Trop. Med. and Hyg.* 1935, xxxviii, March 15, 66; <sup>3</sup>*Jour. Med. Assoc. S. Africa.* 1934, viii, Dec. 8, 875; <sup>4</sup>*Proc. Roy. Soc. Med.* 1935, xxviii, Feb., 391; <sup>5</sup>*Jour. R.A.M.C.* 1934, lxiii, Oct., 238; <sup>6</sup>*Rec. Mal. Survey India*, 1934, iv, Dec., 343; <sup>7</sup>*Ibid.* 1935, v, March 3; <sup>8</sup>*Ibid.* 51; <sup>9</sup>*Ibid.* 97; <sup>10</sup>*Ind. Med. Gaz.*, 1934, lxix, Aug., 434; <sup>11</sup>*Ibid.* 437; <sup>12</sup>*Ibid.* 1935, lxx, March, 143; <sup>13</sup>*Rec. Mal. Survey India*, 1935, v, June, 109 and 121; <sup>14</sup>*Ibid.* 131 and 153; <sup>15</sup>*Amer. Jour. Trop. Med.* 1934, xiv, Sept., 381, and xv, 1935, March 31; <sup>16</sup>*Lancet*, 1934, ii, Sept. 8, 543; <sup>17</sup>*Jour. Trop. Med. and Hyg.* 1934, xxxvii, Oct. 1, 389; <sup>18</sup>*Ibid.* Aug. 15, 241; <sup>19</sup>*Amer. Jour. Surg.* 1934, xxvi, Oct., 111; <sup>20</sup>*Jour. Trop. Med. and Hyg.* 1935, xxxviii, March 15, 65; <sup>21</sup>*Trans. Roy. Soc. Trop. Med. and Hyg.* 1935, xxviii, March 8, 469; <sup>22</sup>*Ibid.* Jan., 421; <sup>23</sup>*Amer. Jour. Trop. Med.* 1935, xv, March, 175; <sup>24</sup>*Ind. Med. Gaz.* 1935, lxx, April, 185; <sup>25</sup>*Rec. Mal. Survey India*, 1935, v, June, 203; <sup>26</sup>*Ind. Med. Gaz.* 1935, lxx, Jan., 1; <sup>27</sup>*Ibid.* 5; <sup>28</sup>*Ibid.* 8; <sup>29</sup>*Ibid.* 1934, lxix, July, 392; <sup>30</sup>*Trans. Roy. Soc. Trop. Med. and Hyg.* 1935, xxix, April, 41; <sup>31</sup>*Lancet*, 1934, ii, Nov. 3, 979; <sup>32</sup>*Rec. Mal. Survey India*, 1934, iv, Dec., 367; <sup>33</sup>*Ann. Trop. Med. and Parasitol.* 1934, xxviii, July, 151, Oct., 255, and Dec., 513; <sup>34</sup>*Ind. Med. Gaz.* 1935, lxx, Feb., 62; <sup>35</sup>*Ibid.* 1934, lxix, Oct., 560; <sup>36</sup>*Ibid.* 568; <sup>37</sup>*Ibid.* 590; <sup>38</sup>*Ibid.* 571; <sup>39</sup>*Rec. Mal. Survey India*, 1935, v, March; <sup>40</sup>*Trans. Roy. Soc. Trop. Med. and Hyg.* 1935, xxix, Jan., 385; <sup>41</sup>*Ind. Med. Gaz.* 1935, lxx, June, 313; <sup>42</sup>*Jour. Trop. Med. and Hyg.* 1935, xxxviii, Jan. 1, 1; <sup>43</sup>*Ind. Med. Gaz.* 1935, lxx, April, 193; <sup>44</sup>*Trans. Roy. Soc. Trop. Med. and Hyg.* 1934, xxviii, Nov., 307; <sup>45</sup>*Ibid.* 1935, xxviii, April, 571.

**MALTA FEVER.** (See UNDULANT FEVER.)

## MANIPULATIVE SURGERY.

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### HISTORICAL SUMMARY.

Although the general principles and the beneficial effects of manipulative surgery have been known and recognized since the earliest days of organized medicine, this valuable therapeutic method has until comparatively recently received little more than passing notice from the medical profession, and, in consequence, has remained for too long a period a domain in which the orthodox practitioner has feared to tread. There is little doubt that this unfortunate state of affairs was mainly due to the fact that, in spite of the teaching of John Hunter as early as the eighteenth century that inflammation normally caused the production of coagulable lymph which was followed by adhesions, the main line of treatment of joint injuries and the neighbouring soft structures was prolonged rest. This doctrine of rest received the unqualified support of the majority of the leading surgeons of the Hunterian period, who, although admitting that inflammation and its late effects caused serious dysfunction of joints, strenuously opposed movements of a joint while any sign of inflammation existed. They held firmly to the belief that rest would ultimately end in the recovery of the injured structures and the restoration of joint function if voluntary movements of parts were withheld while evidence of inflammation persisted, and were only encouraged when all signs of pain and swelling had subsided as the result of such rest.



Owing to the element of pain in injury, this treatment by rest was not unnaturally encouraged and supported by the average patient, and so it came to be believed that, generally speaking, a painful and swollen part should be rested until all signs of pain and swelling had disappeared, no matter how long the time necessary might be. Thus the disastrous effects of the formation of adhesions, with their capacity to limit the range of normal joint movements, was not fully recognized, and consequently, as happens to-day, this type of case drifted into the hands of the unqualified bonesetter, and, although it was well known that permanent injury frequently followed their manipulations, it was equally well known that many cases were successfully treated. The knowledge of such cures led Sir James Paget to write his famous paper (1867), in which he fully described the type of cases which bonesetters cured, and in this paper he emphasized the fact that prolonged rest definitely delayed the recovery of joints after injury.

In the somewhat bitter controversy that followed, Paget was ably supported by Wharton Hood, who published his *Treatise on Bone Setting*, in which he explained the details of the bonesetter's art which he himself had learnt from one of the leading bonesetters of the day, and his disclosures clearly removed much of the mystery and many of the untruths then surrounding 'bonesetting'.

But again the majority of the leaders of the profession preferred to ignore or condemn the practice of manipulation of joints, and little, if any, advance was made until the Great War gave Sir Robert Jones an opportunity which he was not slow to seize, and it may truthfully be said that owing to his support, example, and encouragement to others, more was done for the advancement of the art and practice of manipulative surgery in the period from 1914 to the present day than ever before. But much prejudice still exists in spite of what has been achieved by the few during this all-too-long period of years since the days of Hunter, and the unfortunate result is that those whose work to-day lies in the field of manipulative surgery know only too well that there are countless cases partially or permanently crippled by adhesions which could be cured or alleviated if they were given the opportunity of skilled manipulative treatment.

#### DEFINITION.

Manipulative surgery is the art of manually moving a joint throughout its full range of movements in all directions with the designed object of overcoming resistance to its normal movements arising from pathological causes. It may be said to be based on three main essentials:—

1. A sound knowledge of the anatomy, physiology, and pathology of joint structures.
2. A knowledge of the normal range of movements of all joints.
3. A capacity to diagnose as accurately as possible the probable pathological causes of interference with the normal range of joint movements.

From this knowledge and capacity, combined with constant practice in handling joints in health and disease, it is possible to develop an acuity of touch essential to success in manipulative surgery. Generally speaking, the type of case most amenable to treatment by manipulation is that in which the main pathological cause of interference to joint movements is the presence of adhesions. The various complicated structures that form the joints of the body each and all have an important part to play during joint movements, and by their arrangement and action the special movements for which a joint is designed are performed painlessly and with the least amount of friction. In all joint movements the areolar tissue plays a particularly important part.

## ANATOMY, PHYSIOLOGY, AND PATHOLOGY.

Areolar supporting tissue acts throughout the body as an agent for attaching various structures to each other, and it forms a supporting bedding between the muscles, blood-vessels, nerves, and all deep-seated structures, and in so doing fills up the crevices and spaces round a joint. Thus it acts as padding and as an investing sheath to many structures. But in joints, where free-and-easy movement of one part over another takes place, the fibres of the areolar tissue are arranged in a loose manner, and the tissue contains a small quantity of a translucent lymph-like fluid sufficient to keep it moist, and by this arrangement it has the necessary flexibility and suppleness essential for perfect and comfortable joint movement with the minimum of friction.

The commonest results of injury to a joint caused by either trauma or disease are stiffness, atony and wasting of muscles, and adhesions, and any one condition or a combination of all may exist in the same joint, and lead to loss of function of the joint in varying degree. These results are the sequel to the changes in living vascular tissue reacting to an irritant and ending in the formation of an inflammatory exudate. This exudate consists mainly of lymph which passes from the capillaries to the tissues and back again to the capillaries in an amount which is normally well balanced and controlled. But as the result of an irritant, and in accordance with its severity, this lymph or plasma is poured out in varying quantity in a somewhat altered form and soaks in all directions into the surrounding tissues. This spreading exudate finds its way into the interstices of the tissues and its amount depends on the severity of the injury, and the distance to which it penetrates is governed by the looseness of the texture of the affected tissue. In comparatively loose tissue like muscle the exudate may cause considerable separation of the muscle fibres and collect in such an amount within the inextensible sheath that serious pressure effects on the fibres are caused, with pain and loss of function from the resultant tension. Such interstitial pressure around a joint also causes malnutrition and stretching of the areolar tissue, resulting in stiffness from loss of its flexibility and suppleness.

This condition is really the result of imperfect repair and is one of the most prolific causes of persistent discomfort and dysfunction, antecedent to the formation of adhesions. All kinds of tissue alterations and various functional disturbances follow any interference with the normal circulation of blood and lymph, and the results of such circulatory interference become more serious the longer it lasts. Thus the penetration into the tissue of the fluid and solid constituents of the blood following inflammation acts on the various tissue elements mechanically, physiologically, and pathologically. Mechanically, by pressure on, or stretching of, the cellular elements and their supporting framework, and by the effect of adhesions if the exudate becomes organized into fibrous tissue; physiologically and pathologically, by the increased tissue growth, particularly of the connective-tissue stroma, and the loss of flexibility of the areolar tissue, and the formation of adhesions. The beneficial effects of inflammation as the result of injury can only follow if the processes of inflammation and repair are carried to a successful issue, but as the end-result of inflammation depends on the rate and completeness of absorption of the bleeding and effusion into the tissues, complications and delayed or incomplete recovery follow increased circulatory changes if too prolonged. The general effect on muscles is that they lose their tonicity, irritability, elasticity, and contractility, and in this condition atrophy follows quickly, with loss of function to all degrees. When muscles become relaxed their tendons are at an operating disadvantage mechanically and this further adds to the ineffectiveness of the

weakened muscles so far as the pull on their points of attachment is concerned. Other joint structures such as the ligaments and capsules become stretched and loose in their texture, so that their passive and supporting qualities are diminished.

#### ADHESIONS.

The next stage, if recovery is delayed, is the formation of adhesions. The exudate, by spreading from the original point of irritation throughout the tissues, covers the injured surfaces and the contiguous surfaces of any tissues with which it comes in contact as well as the surfaces of the elements of individual structures, such as muscles, tendons, fasciæ, etc. If it becomes coagulated and transformed into granulation tissue the adjacent surfaces become adherent, and if the granulation tissue alters a stage further, it becomes organized into fibrous tissue. In both conditions an adhesion is formed, the adhesions in the later stage, however, holding the surfaces together much more powerfully than in the first stage, when separation can be more easily affected. Thus, adhesions are certain to form wherever tissues are inflamed and are bathed in the fluid products of inflammation for too long a period, and particularly if, in addition, the parts are kept in contact by prolonged rest or voluntary inaction during the inflammatory process.

The process of the formation of adhesions is essentially the same for all structures, but certain structures are more liable to form adhesions than others, depending chiefly on vascularity—highly vascular surfaces showing a readiness to react to any irritation by forming adhesions easily and quickly.

**Main Effect of Adhesions: Limitation of Movements.**—By their power to bind structures of all kinds together, and by the property of finally contracting when the newly-formed tissue ultimately becomes fibrous, adhesions are capable of causing serious interference with the function of movable parts. They form rapidly under favourable conditions, and, although the adherent surfaces in the early stages may be easily drawn asunder, in the later stages the parts become more strongly bound in an irregular manner.

Similar tissues may adhere to themselves or to another type of contiguous tissue, and all shapes and sizes of adhesions may be formed. Joint adhesions may be intra-articular or extra-articular, or both may be present in the same joint, and bands of fibrous tissue of varying lengths binding two or more surfaces of a movable part, such as a joint, become lengthened by constant stretching. Such bands cause grave disability of a joint, and the constant irritation set up by attempted movements leads inevitably to loss of function and chronic synovial inflammation with a collection of fluid in the joint sac, which in its turn results in serious and often permanent damage to other structures of the joint.

By the mechanical interference with the blood-supply caused by adhesions in muscles and other soft structures changes in their histological elements result in time.

Pain, which generally precedes and accompanies the formation of adhesions, is also a factor in promoting adhesions because it encourages the painful parts to be kept still, so that the opposing inflamed surfaces are kept in contact while the exudate passes through the various processes leading to organization, and later, when contraction follows, further crippling of the joint occurs.

In joints with a loose capsule, which is essential in joints with a wide range of movement, adhesions form quickly between the capsule folds, and any movement tending to open out the adherent capsule causes a degree of pain which further restricts the range of movement by setting up severe muscular spasm.

Extra-articular adhesions are adhesions outside the capsule of the joint and occur in the muscles and their sheaths, tendons, fasciæ, and the fatty pads filling the spaces around joints, such as the infra-patellar pad of the knee-joint. They also occur particularly in the delicate areolar tissue which fills up all the many spaces between and in the different structures of a joint.

The interference with the range of moving parts resulting from any structures of a joint becoming adherent to each other or to neighbouring structures even to a slight degree can easily be visualized when it is remembered that, for a joint to move comfortably and easily through its full range, every structure designed for movement must be capable of free and painless movement on every other structure to which it is adjacent.

When muscles are atonic and wasted the effect on a joint which they normally operate is to prevent its free and painless movements, but before treating such wasted muscles manipulation of the joint may be a necessary prelude, as such condition of muscles, particularly over an extended period, generally is accompanied by malnutrition and loss of flexibility and suppleness of its areolar tissue due to interstitial œdema. This condition is also frequently accompanied by adhesions. Gentle manipulations daily of such a joint stretches the parts, and if active movements follow, either voluntarily or artificially produced by electrical treatment designed to cause controlled painless muscular exercise by the method of graduated muscular contractions (*see the reviewer's Principles and Treatment of Muscles and Joints by Graduated Muscular Contractions*), movements become easy and painless, as the tissue œdema is gradually eliminated, and the formation of adhesions will be prevented unless this has already taken place.

When adhesions have formed, a decision has to be made whether it is necessary first to manipulate the joint under an anæsthetic with a view to separating the adhesions more rapidly, or whether the adhesions are still capable of being separated by the less drastic combined methods of carefully designed active and passive movements and treatment of the muscles by graduated contractions. The decision, mainly governed by the extent and the estimated strength of the adhesions, is not always an easy one to make, and under no circumstances should manipulation of any joint be undertaken in a haphazard way, but only after the joint has been examined and every detail of the case carefully studied.

Bearing in mind that the primary object of manipulating a joint with adhesions is to rupture the adhesions, it will be realized that in so doing it may be necessary to cause a severe subcutaneous aseptic wound, with development of œdema and all the sequelæ of inflammation. To obtain a successful issue, therefore, the manipulation must be followed immediately by such treatment as will ensure, as completely and as rapidly as possible, the absorption of lymph, increase of the local arterial, venous, and lymph circulations, and restoration of the tissue nutrition generally. Above all, the inflamed parts *must* be kept moving in relation to each other—gently at first, and gradually increasing in extent and range, so as to prevent the further development of adhesions which would certainly follow if the parts were rested.

Many joint cases which have been quite properly manipulated fail ultimately to recover because it has not been realized that manipulation is only a necessary preliminary to other treatment, and that it is only possible to obtain the looked-for end-result by a combination of manipulation and well-designed after-treatment, which, based on physiological and pathological principles, aims at stimulating the process of tissue repair by encouraging, as rapidly as possible, absorption of blood, serum, lymph, or inflammatory exudate.

## ROUTINE EXAMINATION OF A STIFF JOINT.

In all cases an estimate of the normal range of the corresponding joint should be made when practicable, and inquiry should be made whether any restriction of movement was ever noticed in the faulty joint before the onset of the disability under examination. Tender points to slight and deep pressure should be noted, with particular attention to any painful regions complained of when touched, moved, or when at rest, as such pain or tenderness is generally an indication of the site of underlying adhesions.

The joint should be gently but firmly put through the fullest range of its movements in each direction and an estimate made of the degree and extent of its restriction, and when this is estimated a careful effort should be made to push the joint beyond the points of restriction to see if pain is caused by attempting to force it beyond each point of limitation. If forcing beyond this point causes pain which is immediately lessened or relieved when the effort ceases, adhesions may be presumed to be present. If, on the other hand, a joint can be manipulated so as to put it through the full range of its normal movements in all directions without pain, it may be confidently asserted that no adhesions are present.

In investigating for the presence of adhesions, it should be remembered that ligaments are not designed actively to support a joint, but to limit its movements, so that when a normal joint is being stretched to its full extent considerable tension can be applied to them. The normal restriction produced by a ligament at full stretch must be differentiated from that caused by adhesions. This point is doubly important when manipulating a joint under anaesthesia, particularly when adhesions restrict only the last few degrees of movement, as it is not always easy to decide if the limitation is due to adhesions or the normal ligamentous restriction.

Adhesions when stretched to the point at which they resist have a characteristic 'springy' feel which experience in handling joints soon teaches one to recognize. This springy feel is also somewhat similar to the resistance caused by muscle spasm or when adaptive shortening of muscles exists. A differentiation may be made by digital pressure over the muscle tendon, which may be felt to be slack or in a state of tension when the movement of stretching is performed.

The degree of irritability of spasmodic muscles can be gauged by the extent of their contraction response as felt by touch when the joint is suddenly moved to a point of pain—a highly irritable joint will cause a rapid and severe degree of reflex spasm easily palpable, while movements conducted gently and less suddenly produce a less degree of spasm.

In the examination of a joint, whether healthy, injured, or diseased, there should be no sudden or unexpected movement or sudden alteration of direction of movement. All jerky movements should be avoided, but the movements should be thoroughly and determinedly carried out, being at the same time smooth in action and conducted with gradually increasing power till the full extent of their range has been reached. The object of manipulating a joint may be said to be to put it through the widest range of movements in all directions of which it is capable without the assistance or resistance of the muscles which act upon it. When the point or points at which a joint is limited is gauged, gentle movements should be carried out within the estimated range, because as a rule when a joint can be painlessly moved within the range of the adhesions the prognosis as a result of manipulation is better with regard to time and completeness of recovery than one in which movement within the range of adhesions causes pain and severe muscle spasm.

When as the result of manipulation some adhesions are stretched but not completely ruptured—either because the movements during manipulation were unintentionally or by design incomplete, or because the natural limit of the joint was reached before the adhesions were sufficiently stretched to make them give way—the outlook is then not so favourable as when adhesions are felt to give way, and the range of joint movement is immediately increased. Stretching adhesions without rupture is usually followed by severe pain which interferes with the after-treatment. If the pain persists even if the range of movements has been increased, it is generally advisable to perform a second manipulation.

It has been laid down that when a joint is restricted in movements in all directions the joint should be rested and not manipulated because it is argued that limitation of movement in all directions usually means that the joint is or has been in a state of acute infective arthritis. If, on the other hand, movements are limited in certain directions only and normal in others, the assumption is that the joint may be manipulated with safety. It is within the reviewer's experience that, as the result of blindly following this rule, many joints have been condemned to long periods of rest which have only aggravated the condition and prolonged recovery, when skilful manipulation would have resulted in complete cure. The rule should be considered in conjunction with all other symptoms.

#### DIAGNOSIS.

In arriving at a decision whether to manipulate a joint or not the following points should be carefully considered: (1) The history of the onset; (2) The degree and type of pain and tendency to muscle spasm; (3) The temperature of the joint; (4) The degree of limitation of movement; (5) Muscular wasting; (6) Expert reading of good stereoscopic X-rays.

**1. History of Onset.**—The history of onset is important because the stiffness associated with an infective arthritis joint makes its appearance gradually and progressively, while the stiffness resulting from traumatic adhesions usually develops much more quickly and follows a comparatively recent, known injury.

**2. Degree and Type of Pain: Muscle Spasm.**—The pain in acute joint disease is more or less constant, much more severe, and greatly aggravated by even slight movements, particularly if suddenly carried out, while that due to traumatic adhesions is usually intermittent and less severe except during extreme movements. In acute disease, movements in any direction usually produce pain, whereas a joint with traumatic adhesions, although it may also be painful when moved in any direction, generally is not, and as a rule shows that there is a greater degree of pain when it is moved in one or two particular directions than in others. An important point when it exists is that in traumatic adhesions it is often possible to move the joint to a considerable extent in several directions *within the range of the adhesions without pain*, pain only being elicited when a point is reached at which the adhesions become dragged on by the movements. The pain of adhesions is mainly caused by their being pulled upon, so that the patient soon learns to avoid pain by limiting his movements, with the result that the unused muscles become toneless and wasted, and the antagonist muscles become spasmodic and ultimately shortened. Such tonic spasm may take place to a severe degree, as may also adaptive shortening, and after manipulation may, owing to the difficulty of overcoming it and the severe degree of pain it causes, greatly retard progress. Active or passive movements of any adherent joint increase the pain, which, if due to traumatic adhesions, settles down much more quickly after rest than when due to acute arthritis.

Pressure usually elicits pain over the seat of adhesions, but in acute joint disease the type of pain is generally more severe and not so localized, and the skin may be acutely painful even to light touch over a wide area.

Pain during sleep, which usually wakens the patient in the early hours of the morning, is one of the most constant and disturbing symptoms of adhesions, as the sleepless nights in time have a serious effect on the patient's general condition. This symptom is so constantly present that the most probable explanation is that it is due to the relaxation of the muscles during sleep allowing the adhesions to be dragged on and so irritated, while during waking hours the muscles are more or less on guard to prevent or limit such drag.

**3. The Temperature of the Joint.**—In acute disease the temperature of the joint is generally raised, but in a joint with traumatic adhesions there is usually no change except in long-standing cases, when if there has been much chronic effusion into the peri-articular tissue the surface temperature may actually be less than normal.

**4. Limitation of Movement.**—The most obvious sequel to the formation of adhesions in a joint is limitation of movement, and it is the correct gauging of the extent and degree of such limitation and deciding if it is due to adhesions or other causes that constitutes the art of manipulative surgery. The most expert handling of a joint is essential when the adhesions are so slight that only a small range of joint movement is interfered with, and a most systematic investigation is necessary to differentiate between adhesions that may be safely freed by manipulation and those that should not be manipulated.

As muscle spasm is usually present to some degree in a joint with adhesions, and as this spasm is so often increased by any effort to move the joint, this increased spasm adds to the limitation of joint movement. By constant practice in handling both diseased and healthy joints a dexterity may be achieved by which a joint with adhesions and acute muscle spasm may be moved so skilfully that practically all muscle spasm is eliminated, and the extent of the limitation caused by the adhesions alone can in consequence be estimated sufficiently accurately to enable one to decide the prognosis from manipulation. There is no difficulty as a rule in diagnosing adhesions where the limitation of movements is obvious, but where the adhesions are so slight that only the last few degrees of movement are interfered with, unskilled and cursory examination will fail to discover them.

**5. Muscular Wasting.**—The importance of loss of tone and muscular wasting which so rapidly follow injury to muscles or any of the structures which form a joint cannot be over-estimated. That many joints which have been manipulated for adhesions have failed to recover the full function anticipated is due, in nearly every properly selected case, to failure to obtain restoration of full function of the muscles normally acting on the joint.

When a muscle's elasticity, contractility, and irritability are normal that muscle may be said to be in a state of tone—that is, it is in a state of attention to respond immediately to a physiological stimulus. The immediate result of loss of tone is that the muscle is not capable of its full normal contraction, and mechanically is placed at a disadvantage with regard to its capacity for work. This is an important factor because the rate of supply and the amount of nourishment brought to a muscle depend upon its requirements as measured by its activity.

Movement, or, in other words, muscle action, plays an important part in the efficiency of the whole circulatory system—arterial, venous, and lymphatic—and besides the mechanical effect of producing movements of parts relative to each other, muscles by their contractions and relaxations act as local pumping agencies for their own circulation *as well as for neighbouring structures*. It

is estimated that the amount of blood required by a muscle in action is at least six times as much as when at rest. The three main objects of the blood are : (1) To supply nourishment and oxygen to all the body tissues ; (2) To remove the waste products which are the result of tissue activity ; (3) To carry various chemical substances from one part of the organism to another. To enable the blood satisfactorily to carry out these three functions, and further to aid the lymph stream from the lymph-spaces in the tissues to the lymph-vessels, its free circulation is essential. As muscle action plays such an important part in aiding the free circulation of both the blood and lymph stream through the tissues its loss or diminution from atony, wasting, or adhesions has a serious effect on the nourishment and activity of the tissues. Also when there is a reduction of blood-supply to a part waste products tend to accumulate in the tissue, and such accumulation has in the end a paralysing effect on function.

Although approximately 40 per cent of the human body weight is composed of skeletal muscle, and in spite of the fact that this large mass of muscle is different from other tissues in possessing the power to contract and perform work, muscle action as a means of assisting in the repair of tissues after injury has not yet received the attention that it deserves.

Effusion into the tissues in an injured area is necessary to repair, and is of a beneficial nature provided the œdema is transitory and the exuded fluids are not allowed to become stagnant in the tissues. Therefore the aim of treatment should be to encourage the rapid absorption of fluids at the right moment and at the correct rate, having regard to their special use in promoting reparative changes, and to call into action the physical and chemical phenomena coincident with the normal activity of muscles which are so essential to their efficiency and sensation of well-being.

There is no more powerful means of stimulating rapid and complete absorption of fluids than by producing painlessly alternate contractions and relaxations of muscles provided they are under complete control as regards rate and degree of both contractions and relaxations. So long as the nerve path is intact this can be achieved under perfect control by the skilled application of the method known as "graduated muscular contractions". The basis of this method of treatment is the antithesis of rest. By it the physiological and chemical changes so essential to repair are stimulated by the muscular action produced, and an active arterial, venous, and lymph circulation is promoted not only to the muscles themselves *but to all the neighbouring tissues*. In addition, the forced muscular activity indirectly aids nutrition of the tissues both as regards oxygen and other substances necessary to nutrition carried by the blood, and the removal of waste products of metabolism and of tissue changes resulting from damage. Loss of tone and wasting of muscles is prevented, and if wasting has taken place, muscle tissue is rapidly regenerated. Movements of joints are caused, and by such movements all contiguous structures are prevented from becoming adherent to each other.

Toneless muscles and muscles that are weak in action from wasting, and muscles that would cause pain by volitional movements owing to structural damage, can be made to perform their function without forcing them to contract enough to cause harm or pain until the recovery of tone is sufficient to allow painless movements of the joint upon which they act throughout its complete range, and the degree and speed of the movements can be accurately controlled from zero to maximum. No matter how painful a joint may be as the result of the changes following injury, all the muscles of that joint can be made to contract without pain by the skilled application of this method of treatment.



By advocating this method for muscles there is no desire to suggest a substitute for muscle function which may be in abeyance, but the treatment is designed to encourage the restoration of function by artificial stimulation with all the attendant beneficial circulatory changes resulting from contraction and relaxation of muscles only during the period that for some reason the muscle function is lost or diminished.

In cases of adhesions in and around muscles, in fasciæ and connective tissue layers, which are a common sequel to inflammation from any cause, there is no more certain way to free them than by treatment by graduated muscular contractions.

**6. Stereoscopic X-rays.**—As many of the conditions contra-indicating manipulation of a joint can be demonstrated by good X-rays, stereoscopic radiography is of great assistance in forming an opinion whether to manipulate a joint or not, and it may be definitely stated that no joint should ever be manipulated to free adhesions without first obtaining an expert interpretation of stereoscopic X-rays.

#### CONTRA-INDICATIONS.

When it is remembered that the successful manipulation of a joint to free adhesions produces a subcutaneous aseptic wound of some of the joint structures of more or less severity, the risk of doing damage beyond what is originally intended will at once be realized. The main danger is using too much force beyond the full range of the joint and thereby causing a ligamentous tear or a fracture or dislocation. This is particularly so when adhesions restrict a joint in such a way that it can almost but not quite reach its full range. In such cases there is not enough extra range of normal joint movement available to stretch the restricting adhesions far enough to rupture them without risk of doing more damage than is intended.

There are certain contra-indications to manipulation of joints, the chief of which is tuberculous disease. Other main contra-indications are: active infective processes, bone overgrowth from any causes such as after fractures, advanced osteo-arthritis, myositis ossificans, bone cysts, and bone tumours. Great caution is required in cases where bones show considerable radiographic translucency from disuse, and where the patella is adherent after fracture of the femur, and in the case of the shoulder after fracture extending into the joint.

Chronic infective arthritic joints should as a general rule not be manipulated, particularly if X-rays demonstrate erosion of cartilage. A joint such as the knee may have a loose body in it which causes immediate locking under certain circumstances. Manipulation carried out with great care so as not to damage the articular cartilage by rough usage may temporarily succeed in moving the loose body to a position where it does not interfere with joint action.

#### SUMMARY.

To sum up, manipulative surgery is a method of treatment employed in association with other treatment or as a preliminary to other treatment, and in general deals with local conditions of bones, joints, and muscles, including conditions involving impairment of mobility and displacement of structures. There are many pitfalls which can only be avoided by a sound knowledge of medical science and the experience founded on it, and to apply manipulative treatment indiscriminately is unscientific; the results may be helpful, useless, or positively dangerous according to the kind of case in which it is employed.

From a long experience of manipulating joints the reviewer's conclusion is that if adhesions are successfully freed, and if this procedure is immediately followed by coaxing the joint through its range of movements in all directions and by treating all the muscles of the joint efficiently by graduated muscular contractions, the end-result in every correctly selected case will be complete restoration of function both as regards range of movements and muscular power.

### MEASLES.

J. D. Rolleston, M.D., F.R.C.P.

**EPIDEMIOLOGY.**—According to J. G. Alonso,<sup>1</sup> who records his observations on an outbreak of measles in a country district, there are about 50,000 cases of measles in Spain each year. During the quinquennium 1929-33 measles caused 18,766 deaths, or more than the combined deaths from whooping-cough, diphtheria, and scarlet fever during the same period. Unlike what occurs in some countries the mortality in Spain was higher in the rural districts than in the towns, except in infants under one year, probably because breast-feeding is continued longer in rural than in urban districts.

G. R. Moreau<sup>2</sup> states that 798 cases of measles were admitted to the Hôpital Hérold, Paris, during the period 1932-4, with a fatality rate of 12.03 per cent, as compared with 14.4 per cent at the same hospital in the winter of 1922-3, 14.43 per cent at the Hôpital des Enfants Malades in 1927-32, and 3.68 per cent at the Hôpital Pasteur, where the patients are mainly adults, in 1926. Ninety cases at the Hôpital Hérold were in the first year of life, but only two of these were under 6 months, 215 were in the second year, 381 were aged from 2 to 6, 89 from 6 to 10, and 21 over 10. The mortality was highest in the first year (37.14 per cent in 1933 and 42.85 per cent in 1934), 16 (14.5 per cent) were complicated by bronchopneumonia, with 72 deaths (62.06 per cent), and 66 by otitis media (3.27 per cent). Each patient was given a prophylactic injection of diphtheria antitoxin on admission, but 20 contracted diphtheria.

**SYMPTOMS AND COMPLICATIONS.**—J. A. Winstead<sup>3</sup> records the case of a male infant, whose exact age is not stated, who a fortnight after the onset of measles developed *gangrenous ulceration* of the right foot, which he attributed to nutritional deficiency. Recovery took place on a diet rich in vitamins and the application of dry heat and ultra-violet rays.

A case of *purpura* following measles is reported by E. C. Perlman<sup>4</sup> in a boy aged 4 years, who developed numerous discoloured areas on the arms and legs and about the mouth in convalescence from a mild attack of measles. Shortly afterwards smaller lesions appeared on the mucous membranes of the tongue, palate, and gums, and on the cheeks. Considerable oozing of blood took place from the gums, especially in the mornings. There was no history of hæmophilia or any cardiovascular disease in the family, and the patient had had no previous illnesses. The hæmoglobin was 74 per cent, the red cells numbered 4,140,000, and the white cells 4700; polymorphonuclears 54 per cent, lymphocytes 43 per cent, eosinophils 3 per cent, bleeding time 37 minutes, coagulation time 2½ minutes, platelet count 90,000. Treatment consisted in daily injection of 25 c.c. of whole blood and calcium lactate internally in 15-gr. doses. Recovery took place.

R. Ruggeri<sup>5</sup> records two cases of measles with unusual *neurological* and *psychical sequelæ*. The first was in a boy aged 7 years, who on disappearance of the measles eruption developed somnolence, choreiform movements, and tremors of the limbs. Subsequently a change of character ensued, shown by acts of violence, lack of discipline, and vagabondage similar to that following an attack of lethargic encephalitis. The second case was that of a boy aged 12, in whom an attack of measles at the age of 4 years was

followed by convulsions, phrenasthenia, and the development of the adiposo-genital syndrome.

**DICK TEST IN MEASLES.**—I. Taylor<sup>6</sup> reports his observations on the Dick test in 227 cases of measles, of which 119 gave a positive and 118 a negative reaction. He comes to the conclusion that a lack of circulatory streptococcus antitoxin as indicated by a positive Dick reaction is associated with a slightly raised liability to bronchopneumonia and a very greatly increased risk of such bronchopneumonia being fatal. Otorrhœa developed rather more frequently in the Dick-positive cases (26 per cent) than in the Dick-negative (19 per cent). The laryngitis occurring among four Dick-positive cases was more severe than among three Dick-negative children. Three of the former were fatal, while the latter all recovered.

REFERENCES.—<sup>1</sup>*Arch. españ. de Ped.* 1934, xviii, 577; <sup>2</sup>*Thèse de Paris*, 1935, No. 114; <sup>3</sup>*Jour. of Ped.* 1935, vi, 382; <sup>4</sup>*Arch. of Ped.* 1934, li, 596; <sup>5</sup>*Pediatrics*, 1934, xlii, 1329; <sup>6</sup>*Brit. Jour. Child. Dis.* 1934, xxxi, 290.

### MEDITERRANEAN FEVER. (See UNDULANT FEVER.)

### MEGALOCOLON, CONGENITAL (Hirschsprung's Disease).

John Fraser, Ch.M., F.R.C.S.Ed.

The value of *sympathectomy* or *ganglionectomy* as a means of treating congenital megalocolon has been repeatedly under discussion since the method was first described by Royal in 1929, and we think it is correct to say that the majority of those who have practised the operation have been impressed by the benefit which it produces. But that there are two sides to the question is indicated by a report on three cases of megalocolon by J. Guilleminet and M. Latarjet.<sup>1</sup> They are quite frankly and openly opposed to sympathectomy in cases of this nature, and it is significant that in the discussion which ensued there was no one prepared to champion the sympathectomy procedure. In brief the facts are these. Guilleminet reported three cases affected with megalocolon, their ages being 18, 8, and 13 years respectively. All were examples of pronounced colon dilatation and hypertrophy, but it is perhaps significant that in two there was a congenital malformation of the anus, in one instance an imperforate anus having existed at birth, while in the other case the anus was vaginal in type. The first case, a girl of 18 years, was treated by excision of the pelvic colon, on the Mikulicz plan, and the result was all that could be desired. The second case, the patient being 8 years old, underwent the operation of lumbar ramisection, when, in the words of the reporter, "four to five rami communicantes corresponding to the 4th and 5th lumbar nerve-roots were sectioned". The result was most disappointing; no benefit appeared, and six weeks later a Mikulicz resection of the pelvic colon was done, in this instance unfortunately with fatal result. The third patient, a girl of 13 years, underwent a Mikulicz resection with results as good as those recorded in the first case. On these findings the operation of sympathectomy has been adversely criticized not only by the reporters but also by Dr. Patel and Dr. Wertheimer.

On reading the reports one is left with the impression that the criticism is scarcely justified, and for the following reasons: (1) A single failure is an insufficient basis upon which to condemn any procedure; (2) The period of six weeks which elapsed between the sympathectomy and the colon excision was not long enough to permit of improvement in bowel function—months and even years may elapse before the maximum benefit is obtained; (3) The removal of the rami communicantes of the 4th and 5th lumbar ganglia is an insufficient procedure if sympathetic denervation of the left colon is intended;

(4) The association of anal malformation with the colon dilatation raises doubt in one's mind as to whether these cases were true examples of congenital megalocolon—if not, the operation of sympathectomy might well yield unsatisfactory results. It seems, therefore, that the criticism implied in the report need not be taken too seriously, and, further, there is increasing evidence of the outstanding value of sympathectomy in cases of true congenital megalocolon; but it is obvious that much depends upon the operation being as complete an extirpation as possible if a satisfactory result is to be secured.

REFERENCE.—<sup>1</sup>*Lyon chir.* 1935, xxxii, 343.

**MENINGITIS.** (*See* CEREBROSPINAL FEVER; EAR, AFFECTIONS OF—INTRACRANIAL COMPLICATIONS OF EAR DISEASE.)

**MENTAL AFFECTIONS.** (*See also* ANXIETY AND DEPRESSIVE STATES; NEUROSES\* OF WAR; PSYCHOLOGICAL TREATMENT AND ITS RESULTS.)

**MENTAL ASPECTS OF GYNÆCOLOGY.** *H. Devine, M.D., F.R.C.P.*

H. Leaver<sup>1</sup> emphasizes the importance of a psychological approach in dealing with gynæcological cases. He expresses the view that a woman, presenting herself for the first time about a pelvic symptom without manifest sign of disease of the genital organs, runs a considerable risk of being operated upon, on the principle that there might, after all, be some abnormal condition there, and, in any case, she would be better without her appendix. The writer recalls more than one instance in which he has performed a curettage, a suspension of the uterus, and an appendicectomy for the relief of dysmenorrhœa, right-sided pain, and backache, and has been disappointed in the result. He feels that he has been inclined to impatience and has suggested that the condition was due to 'nerves'. He considers that he should have made that diagnosis in the first instance. All the symptoms which may be met with in gynæcological practice may be functional—that is to say, they are not due to a physical condition; such physical condition is the result of dysfunction of an organ due to mental causes; or the symptoms may be due to normal functioning of an organ abnormally interpreted by the patient. Vaginismus, dyspareunia, pain in the lumbar or sacral region, pain in the right or left iliac fossa, dysmenorrhœa, menorrhagia, amenorrhœa, can all be due to mental causes.

One can easily understand how vaginismus can arise. The tubular muscle of the vagina is under control of the sympathetic nervous system. During the emotion of fear there is always spasm of the vagina and anus. The symptom may be due to a conflict between an impulse and a fear, or a duty, or both. A woman may have wished to marry a man whom, for some reason, she was forced to renounce. She may have later married another man against her wishes. In her confessed or unconfessed romantic imagination she desires union with her true love, and she would refuse to surrender to his rival if she dared. But duty drives, and prompts her to yield herself to him, whilst desire turns her thoughts in another direction. A symptom, vaginismus, partly solves her problem. Coitus becomes so painful that cohabitation becomes impossible, and ceases. Perhaps a former illicit attempt at coitus by her lover had, because of the fear in her mind, been too painful to allow of its consummation. At any rate, the idea of intercourse being so painful as to be impossible occurs to her. She attempts to repress it, being driven to do so by the sentiment of duty which she has acquired by imitation from her parents or teachers. Her pain is real and severe, perhaps unbearable, and as a result of her conflict her vital energy may become exhausted. Muscular effort, which normally would cause no symptom of fatigue, now causes her unutterable weariness, especially

in the tendinous insertions of the lumbar muscle. She may develop the typical syndrome of neurasthenia.

One can easily see how dyspareunia can arise. A woman whose economic circumstances are precarious, dreads the arrival of another infant. She may already have a brood of children, and another child means the beginning all over again of the soul-destroying grind. Her callous and unemployable husband will not deny himself his pleasures, and she knows only too well her wifely duties. Unformed in her mind, the idea of sex becomes associated with fear; and then every time the sex impulse is moved it is supplanted by fear. She may have a slight cervical erosion with a little infiltration of the connective tissue between the cervix and the pelvic wall; perhaps a little lymphadenitis of a pelvic gland. All this might be sufficient to cause a little pain on movement of the cervix, but much greater pain would be unnoticed during normal sexual emotion and activity. But she may have felt the pain on an occasion when her sex emotions had not been aroused. The idea comes to her mind: "If coitus were so painful that it could not happen, I could never become pregnant again." The idea is repressed, it recurs, and is repressed again and again. Coitus becomes more and more painful, and her problem is partly solved by a neurotic symptom. Her husband may beat her, but that only confirms her condition, and she attains peace through invalidism. Should she place herself in the hands of her medical adviser, and it is found that she has a retroversion of the uterus, the prolapsed position of the ovaries will be blamed, and an operation might be performed to replace the uterus with no result.

The author observes that modern social life is such as to increase the possibilities of the derangement of genital organs of women. Modern music, founded on the native melodies of the most salacious race in the whole world, a race whose social sanctions are notoriously the loosest in the world; dancing, which has its origin in the savage ritual of tropical tribes; open-air sport in costumes which are so scanty and suggestive that simple nakedness would be less stimulating; the independent spirit of youth which, in our weakness, we tolerate and which demands an early and full expression of its individuality, which means the early satisfaction of every instinctive disposition we inherit; the tumbling authority and prestige of some of our greatest social sanctions in which have been preserved the best of our social laws—the church, marriage, the family, the nation, the professions—these things bring about a state of affairs in which increased sexual stimulation, together with a disinclination to shoulder responsibilities to the species, result in the conditions in which a clash is inevitable, and in which clash the individual must always suffer.

In concluding his article Leaver cautions the practitioner who is not specially qualified to attempt an analysis of his neurotic patients. He points out that these patients are particularly prone to 'transfer' themselves to the practitioner, and will absorb much more time than he can possibly spare. But this does not mean the general practitioner can do nothing to help those patients who cannot adjust themselves towards their social obligations. Treatment must be summed up in the word 'education'. The neurotic women whom the author describes in his paper are ill because they are ignorant—ignorant as regards the working of their bodies, ignorant of their own natures, and ignorant of the reasons underlying our social laws and moral sentiments. And they are ill because they have not enough self-respect. The doctor is still the family doctor, the wise help in time of trouble. Our success will be less in proportion as we merely treat the sick when they are brought to us after the damage is done. Prophylaxis is practised among the well; the doctor can help the children by using his influence to prevent the parents from crushing out the child's individuality, or, by timely warning, urge them to curb in the child the impulse

of mastery which, unless curbed, must lead to the inevitable clash between the growing youth or maiden and organized society, and from which clash organized society always issues victorious. The wise doctor can use his position of authority and insist that the blooming daughter shall not reach puberty in complete ignorance of the noble part she will be called upon to play in the all-important work of perpetuating our species; that she shall learn, in spite of the unfair economics which make this indeed a man's world, that after all woman is the noblest work of creation, and, in the last essence, man is but her instrument.

Writing on psychiatric aspects of gynecological conditions J. A. McGeorge<sup>2</sup> observes that pelvic disorders may, and often do, produce definite mental symptoms, but, in addition, there are frequently seen women of the ultra-neurotic type who delight in recounting their various symptoms of discomfort, apparently located in the pelvis. These, however, on closer examination, are found to be part of a general condition which has no organic basis. As will be shown, many of these patients eventually fall into the hands of an over-ardent surgeon who, accepting their statements at their face value, operates and (let us hope) to his horror discovers that there is no abnormality present.

The author hopes that the following statements will prove provocative of discussion or even dissension, for he proposes to disagree with certain long-held beliefs that various normal physiological functions in the female can, of themselves, be productive of psychiatric disorders, and to warn those persons who tend to regard all pelvic pain as a legitimate excuse for immediate operative measures, to take into consideration the mental make-up of the person concerned. The latter does not, of course, apply so much to the established surgeon as to the neophyte, to whom the neurotic woman is a fertile territory for surgical exploration.

From the earliest beginnings of established psychiatry the female pelvis has been regarded with a certain amount of awe, and many aspects of insanity have been explained by reference to some female function, normal or abnormal, which affords an excuse for establishing an organic basis for the condition. The reason for this should be obvious. An organic basis means that something active can be done in the matter. Some cavity can be explored, some focus drained, or something extirpated with reasonable prospects of complete recovery, if this theory is sound. Unfortunately even the most enthusiastic supporters of the physiogenic etiology had to admit that their hopes were doomed to disappointment in too many instances, and gradually it has come to be realized that a normal woman will pass through the stresses of pregnancy, puerperium, and the menopause without developing a psychosis, and that it is the woman with an underlying psychopathic or neuropathic constitution who gives way under the strain, just as she would if subjected to any other severe trauma.

The tables below give the results of investigation of 1000 patients admitted to Broughton Hall, excluding organic psychoses. For classification the cases fall into eleven diagnostic groups, as shown in *Table I*.

From this table it may be seen that the most common psychosis present was a depressive state, occurring, as it did, in more than 40 per cent of all cases. Next came hysteria with 24 per cent, and the only other condition of any considerable frequency was paraphrenia in 10 per cent of the admissions.

About one-third, actually 32.8 per cent, of these patients had pelvic symptoms of one sort or another which they believed to be of sufficient importance to mention during the routine examination. The relationship of these symptoms to the various psychiatric conditions is shown in *Table II*.

Although the hysterics are numerically considerably less than the depressive

states, when it comes to calculating the percentage of the total cases with pelvic symptoms, they are found to exceed all other states. Only 29 per cent of women, suffering from some form of depression, had a co-existing abnormal pelvic state, but it was present in 50 per cent of cases of hysteria, and the actual percentages of the total cases with this state were 37·5 per cent and 40·3 per cent respectively.

*Table I.*—CLASSIFICATION OF CASES.

DIAGNOSIS	NUMBER OF CASES	PERCENTAGE OF TOTAL
Depressive states .. ..	413	41·3
Manic states .. ..	33	3·3
Manic-depressive states .. ..	18	1·8
Paraphrenia .. ..	106	10·6
Schizophrenia .. ..	72	7·2
Confusional states .. ..	53	5·3
Hysteria .. ..	240	24·0
Neurasthenia .. ..	31	3·1
Anxiety neurosis .. ..	14	1·4
Obsessional neurosis .. ..	13	1·3
Psychopathic personality .. ..	7	0·7
Total .. ..	1000	100

*Table II.*—CASES WITH PELVIC SYMPTOMS.

DIAGNOSIS	NUMBER OF CASES	PERCENTAGE OF GROUP	PERCENTAGE OF TOTALS
Depressive state .. ..	123	29·8	37·5
Manic state .. ..	8	24·2	2·4
Manic-depressive state .. ..	1	5·5	0·3
Paraphrenia .. ..	25	23·6	7·7
Schizophrenia .. ..	12	16·6	3·7
Confusional state .. ..	13	24·5	3·9
Hysteria .. ..	132	50·5	40·3
Neurasthenia .. ..	8	25·8	2·4
Anxiety neurosis .. ..	1	7·1	0·3
Obsessional neurosis .. ..	3	23·0	0·9
Psychopathic personality .. ..	2	28·5	0·6
Total .. ..	328		100

An analysis of the different types of condition present gave some interesting information. It was found that 42 per cent of the patients suffering from hysteria complained of some form of menstrual dysfunction, and that this was by far the commonest condition, whereas the menopause, artificial or normal, was associated with 12 per cent of depressive states. Both of these forms of mental illness, however, had one thing in common; this was the frequency with which pelvic operations had occurred. The unfortunate hysteric suffered more from the ardent attentions of the surgeon than did the melancholic. The figures show that 16 per cent of these patients had been subjected to operations which were ill advised, as the patients' conditions were psychical and not physical. Later, cases will be given to illustrate to what extent operative interference may go, but for the present we shall consider the forms of pelvic disorder found (*Table III.*)

The figures given so far tend to show that psychiatric disorders fall into two main groups from the gynaecological point of view. These are the depressive states and hysteria. In the further consideration of the subject the author deals with these conditions only.

Table III.—ANALYSIS OF PELVIC CONDITIONS.

DIAGNOSIS	MENSTRUAL DYSFUNCTION	ARTIFICIAL MENOPAUSE	NORMAL MENOPAUSE	LACTATION	PURPERIUM	PREGNANCY	PELVIC OPERATIONS	FRIGIDITY
Depressive states ..	40	23	29	6	18	9	36	0
Manic states ..	5	—	—	1	2	—	1	—
Manic-depressive states ..	1	—	—	—	—	—	1	—
Paraphrenia ..	12	5	3	1	2	—	8	2
Schizophrenia ..	12	—	—	—	—	—	2	—
Confusional states ..	8	1	1	1	2	1	4	—
Hysteria ..	101	12	6	—	9	14	38	9
Neurasthenia ..	2	2	2	1	—	1	3	—
Anxiety neurosis ..	1	—	—	—	—	—	—	1
Obsessional neurosis ..	3	—	—	—	—	—	2	—
Psychopathic personality ..	1	1	—	—	—	—	2	—

Table IV gives some idea of the principal forms of menstrual dysfunction which may occur, and the proportion of these in the mental states under consideration.

The percentages given in Table IV show that some menstrual disorder is quite a common occurrence in patients suffering from hysteria, whilst it is comparatively rare in the other states. The principal irregularity is dysmenorrhœa, which was present in 23 per cent of all cases, an unduly large proportion, and probably this can be explained by the characteristic inability of these patients to bear any discomfort and their tendency to exaggerate any symptoms in a bid for sympathy.

Table IV.—FORMS OF MENSTRUAL DYSFUNCTION.

MENSTRUAL CONDITION	HYSTERIA	DEPRESSIVE STATES
Irregularity in time ..	41 (17 %)	19 (4 %)
Amenorrhœa ..	39 (16 %)	15 (3 %)
Dysmenorrhœa ..	55 (23 %)	20 (5 %)
Menorrhagia ..	21 (9 %)	9 (2 %)
Scanty flow ..	21 (9 %)	10 (2 %)

The author now comes to the question of pelvic operations which have been performed on women suffering from mental disorders. Attention has already been called to the fact that 16 per cent of hysterics have been in the surgeon's hands, and as these patients are, in the majority of instances, comparatively young, the ages ranging from 15 to 35 years, it seems that such treatment can hardly be justified, especially when hysterectomy has been performed during this period of reproductive usefulness. This has occurred in 5 per cent of cases. The commonest operation was oöphorectomy, in 8 per cent. The actual figures are given in Table V.



Although the age period for melancholics is later than that for hysterics, the same percentage have suffered hysterectomy—namely, 5 per cent of all cases in the group to which they belong. The number of instances of oöphorectomy and salpingectomy is unduly high in these comparatively young people, being 8 and 7 per cent respectively. In two of the cases of salpingectomy there had been ectopic gestations, but there was no obvious organic condition to account for the operation in the other patients. No reason was given by the surgeon for the sterilization in the two instances quoted. Apparently it was done because the mental state was wrongly diagnosed and it was considered that further pregnancies were undesirable.

Table V.—PELVIC OPERATIONS ON PATIENTS WITH MENTAL DISORDER.

OPERATION	HYSTERIA	DEPRESSIVE STATES	OTHER STATES
Hysterectomy ..	12 (5 %)	23 (5 %)	9
Oöphorectomy ..	20 (8 %)	12	7
Uterine replacements ..	8	5	5
Salpingectomy ..	17 (7 %)	5	6
Dilatation of vagina ..	—	—	1
Dilatation of cervix ..	—	1	—
Curettage ..	5	1	1
Repair ..	—	1	1
Sterilization ..	2	1	1

The author then comes to the consideration of the etiological factors believed to be responsible for the development of the patient's mental state. These vary considerably, but in quite a few cases some pelvic condition was regarded as being responsible. The various causes and the proportion in which each is present can be seen in Table VI. The author is, of course, still dealing only with those cases in which there was some gynæcological condition.

Table VI.—ETIOLOGY OF MENTAL DISORDER IN GYNÆCOLOGICAL CONDITIONS.

ETIOLOGY	HYSTERIA	DEPRESSIVE STATES	OTHER STATES
Normal menopause ..	5	28	9
Artificial menopause ..	3	11	2
Puerperium ..	5	26	9
Pregnancy ..	20	13	3
Menstruation ..	10	1	2
Pelvic operation ..	9	3	2
Frigidity ..	10	1	1
Sexual perversion ..	2	2	—
Marital discord ..	18	6	8
Ill health ..	11	10	10
Worry ..	35	14	13
Other causes ..	3	7	9
Unknown ..	5	—	10

This table gives some interesting information. We can see from it that in hysterics general causes play a greater part than gynæcological causes in the etiology, the numbers being 72 and 64, whilst the reverse is true in the case of the depressive states, 85 and 37. In the first, pregnancy holds pride of place, as might be expected, for it is a time of stress and one for which these patients

are ill-prepared because of their mental instability. The most common cause of all is a psychogenic one—namely, worry—and this was present in 35 cases. This also is not unexpected, for it is an accepted fact that hysterics are incapable of standing up to adverse conditions. In the depressive states we have a different picture, for here the physiogenic causes predominate, the principal ones being the normal menopause and the puerperium in 28 and 26 cases respectively. How many of these factors are actually responsible for the conditions they are supposed to have caused is a doubtful question, for, as before mentioned, they are very often only stresses exercised on an unstable personality which would have succumbed to any other force of sufficient intensity.

In concluding the writer points out that it is of the utmost importance to take into consideration the psychical constitution of the patient in determining the value of those pelvic symptoms which can only be subjective in nature, such as backache, dysmenorrhœa, pain in the lower part of the abdomen, and other feelings of discomfort, which are always grossly exaggerated by the hysteric. If there should be the slightest doubt as to the genuineness of these, it is suggested that a psychiatrist should be afforded an opportunity of expressing an opinion.

If the general practitioner and the gynaecologist could be encouraged to adopt a psychological approach to their patients during pregnancy, puerperium, lactation, and menopause, there would be fewer neurotic women and more grateful husbands. If the process through which the patient is about to go were explained to her and her fears were allayed by a sympathetic attitude, then the tendency to an over-reaction would be less and the risk of the development of a state of chronic invalidism and dependence would be minimized.

It lies within the power of the medical man whose practice is largely a feminine one to prevent a neurosis or even a more serious condition by the prophylaxis of understanding, appreciation of difficulties, and a capacity to recognize the danger signals of faulty adjustment, mental instability, and lack of emotional balance. He will then be in a position to estimate a patient's ability to cope with the situation which confronts her and to advise accordingly. It will be woe to the psychiatrist's practice when this is generally understood, but the ill wind to him will blow good to the patient, and that should be his reward.

REFERENCES.—<sup>1</sup>*Med. Jour. of Australia*, 1934, xxi, Dec. 15, 770; <sup>2</sup>*Ibid*, 777.

## MENTAL CONDITIONS IN RELATION TO PHYSIQUE.

H. Devine, M.D., F.R.C.P.

J. L. Clegg<sup>1</sup> is responsible for a painstaking research on the relation of physique and character in psychotic subjects: 100 male cases of schizophrenia, 100 male cases of manic-depressive psychosis, and 100 normal males were examined anthropometrically, with a view to determining whether there were any differences in body proportions associated with differences in the mental state. As a result of these investigations, small but significant differences between the three groups were found. These in brief were: (1) The stature of the psychotic was less than that of the non-psychotic. (2) The cranial capacity of the psychotic was likewise less than that of the non-psychotic. (3) The difference in cranial capacity was mainly due to diminution of head length and height, except in the case of manic-depressive insanity, where the skull was also defective in breadth. (4) Apart from lack of height when viewed from the front, there was no departure from the normal in the shape of the skull amongst the psychotic. (5) The face was somewhat narrower in the psychotic than in the non-psychotic, and this narrowness was most marked

in the lower part of the face in the schizophrenic type of patient. (6) As opposed to the schizophrenic type, the face of the manic-depressive was shorter and more shield-shaped in outline. (7) The nose tended to be longer in the psychotic than in the non-psychotic, and in schizophrenic patients was also narrower. (8) The upper lip of the schizophrenic was shorter than that of either of the other two groups. (9) The ear of the schizophrenic was also both shorter and narrower than that of either of the other two groups. (10) The proportion of the trunk to the leg was less amongst manic-depressive patients than amongst schizophrenic patients or normal individuals. (11) Consequent upon the above, the legs of manic-depressive patients were proportionately longer than those of the other two groups. (12) The length of the arm was less in the psychotic than in the non-psychotic, this being most noticeable in the schizophrenic group. (13) Increased pelvic width was common amongst manic-depressives. (14) The shoulders were narrower in the psychotic than in the non-psychotic. (15) The neck of the psychotic was shorter than that of the non-psychotic.

K. J. Campbell<sup>2</sup> also writes on the relation of the types of physique to the types of mental diseases. The author examined a group of 1203 cases whose weight in pounds per inch of height was recorded. She found no difference in four out of six comparisons. The curve for weight in pounds showed that the male maniac was on the average 10 lb. heavier than the male dementia præcox patient. The curve in pounds per inch of height showed that the mode weighed 10 lb. per inch more for the male manic than for the male præcox. Kretschmer gives 0.30 lb. per inch difference. The author thinks that the fact that her group consisted of mixed nationalities, whereas Kretschmer's was purely Teutonic, may explain the difference.

REFERENCES.—<sup>1</sup>*Jour. of Ment. Sci.* 1935, lxxxi, April, 297; <sup>2</sup>*Jour. Abnormal and Social Psychol.* 1932, xxvii, July-Sept.

## MENTAL DISEASES.

H. Devine, M.D., F.R.C.P.

**After-histories of Discharged Mental Patients.**—L. H. Wootton, R. W. Armstrong, and D. Lilley<sup>1</sup> write an investigation into the after-histories of patients discharged from Ewell Mental Hospital. This is an investigation to ascertain the ultimate fate of certified patients who have been discharged from mental hospitals as 'recovered' or 'relieved'. The inquiry was conducted by personal interview in all cases, except in those who were dead, untraced, or again certified in a mental hospital. The few exceptions to this rule were those who had moved away to a distant part of the country, and these were communicated with by letter. The investigation in the home was carried out by a social worker, trained to the work and with considerable experience of mental cases. She was able to interview the patients, to note their mental condition and environment, and to amplify her observations if necessary by further inquiries of relatives, etc. In this way a complete picture of each patient's life since discharge was obtained, and the knowledge gathered falls chiefly under the following heads: (1) If still in good mental health. (2) If there had been any mental relapse necessitating re-certification, or 'nervous breakdown' treated at home or outside mental hospitals since discharge. (3) If the environment were natural or sheltered; the patient's capacity for earning own living, or carrying on house-work satisfactorily in the case of married women.

As a considerable proportion of the admissions to Ewell during the years under review happened to be of the dementia præcox type, the writers have taken the opportunity of ascertaining the number of these admitted and discharged, and the after-history of these cases since they left the hospital.

Attention has also been directed towards the effect of subsequent childbirth in patients who had previously been admitted and recovered from a psychosis connected with pregnancy or the puerperium, as this must have an important bearing on the question of sterilization of women whose mental breakdown has been due to child-bearing.

The tables show the collected results of the investigation.

Table I.

YEAR	AVERAGE NUMBER CERTIFIED PATIENTS	NUMBER OF DIRECT CERTIFIED ADMISSIONS	NUMBER DISCHARGED RECOVERED OR RELIEVED	PERCENTAGE OF DISCHARGES	NUMBER OF DISCHARGES TRACED
1928 ..	422	135	52	38.5	44
1929 ..	427	84	54	63.3	45
1930 ..	431	57	29	50.8	26
1931* ..	413	41	21	51.2	16

\* Number of certified admissions small owing to the reception of many voluntary patients under the Mental Treatment Act, 1930.

Table II.

YEAR	MODE OF DISCHARGE	NUMBERS DISCHARGED	RESULTS				
			W.	S.	r.	R.	I.
1928	Recovered	38	26	0	1	4	7
	Relieved	6	2	1	1	1	1
1929	Recovered	40	26	1	3	4	6
	Relieved	5	0	1	1	0	3
1930	Recovered	23	16	1	0	3	3
	Relieved	3	1	1	0	1	0
1931	Recovered	14	5	0	2	4	3
	Relieved	2	1	1	0	0	0
Totals		131	77	6	8	17	23

W. = Completely well since discharge.

S. = Has remained well in a sheltered environment.

r. = A minor relapse without the necessity for hospital treatment.

R. = Has had one or more major relapses in a mental hospital.

I. = Certified insane at the time of inquiry.

Table III.

YEAR	NUMBER ADMITTED	NUMBER DISCHARGED	RESULTS					
			W.	S.	r.	R.	I.	U.
1928	36	13	6	1	0	2	2	2
1929	28	18	7	0	1	3	3	4
1930	21	7	3	0	0	2	2	0
1931	19	9	2	0	2	2	0	3
Totals	104	47	18	1	3	9	7	9

U. = Untraced. Other lettering as in Table II.

Table I shows the number of cases discharged recovered or relieved, the percentage of such discharges on the direct admission-rate, and the number

traced in each year during this research. The average number of certified patients resident during the year is included for comparative purposes.

*Table II* gives the results of the general inquiry, showing the degree of recovery and its permanence up to the present time.

*Table III* shows the figures under the same headings as *Table II* for all those cases who were clinically diagnosed during their stay in hospital as dementia præcox.

*Table IV* contains a similar analysis of the puerperal cases.

*Table IV.*—ANALYSIS OF PUERPERAL CASES ADMITTED 1928-31.

	RESULTS OF DISCHARGES					
	W.	S.	r.	R.	I.	U.
Number admitted ..	..	..	..	..	..	..
Number discharged ..	..	..	..	..	..	..
Still certified ..	..	..	..	..	..	..
Died ..	..	..	..	..	..	..
Transferred under certificate ..	..	..	..	..	..	..
Discharged since 1931 ..	..	..	..	..	..	..
TOTAL	16	8	0	2	2	4

Of the 8 'W' cases, 7 had one or more children since discharge.

Lettering as in *Tables II* and *III*.

It will be seen by *Table IV* there were 24 cases admitted during the four years under survey who were suffering from psychosis connected with pregnancy or the puerperium. Of the 12 of these who were discharged and have been traced, no fewer than 8 have remained well up to the time of inquiry, while, of these, 7 have had one or more children since discharge without any mental symptoms. This suggests that possibly the importance of pregnancy or the puerperium as a precipitating factor in an attack of insanity has been over-rated; in many cases the occurrence of the two conditions may be merely coincidental; further research is obviously indicated in this connection on account of its bearing on the question of sterilization, or the giving of contraceptive advice to those who have recovered from a puerperal psychosis.

*Conclusions.*—During this investigation into the after-history of discharged certified patients of Ewell Mental Hospital, several suggestions arise which are of some interest: (1) In many cases an isolated psychotic attack carries with it a favourable prognosis with little tendency to recurrence. (2) There appears to be a 'danger period' about a year after discharge when the tendency to relapse is maximal. After this the probability of recurrence tends to diminish, except in the case of schizophrenics. (3) Cases of dementia præcox show the same 'danger period' at the end of a year, and in addition a further critical time about a year later. (4) The authors have been impressed by the number of instances in which clinically typical schizophrenics show no traces of the 'præcox' attitude persisting a considerable number of years after recovery. (5) The importance of pregnancy of the puerperium as a precipitating factor in an attack of insanity is questioned. (6) In view of these findings a regular follow-up of discharged cases appears highly desirable in order to ensure any necessary treatment before the psychosis becomes fully re-established. (7) Further investigation on these lines over a larger group of cases would appear to be profitable.

**MESENTERY, SURGERY OF.***A. Rendle Short, M.D., F.R.C.S.*

**Malignant Tumours of the Omentum.**—About 75 of these appear to be recorded in the literature. They are mostly to be classed as sarcomata. H. K. Ransom and P. C. Samson,<sup>1</sup> who report a case, say that accurate diagnosis is difficult. There is usually abdominal pain and a tumour, coupled with loss of weight, dyspepsia, and sometimes a bloody ascites. The prognosis is very unfavourable.

**Mesenteric Cysts.**—C. S. Roller,<sup>2</sup> of California, has had 3 cases, all doing well after operation. About 500 have been put on record, but the mortality is higher than it should be because only too often the patient does not come under observation till some complication has ensued. The presence of a freely movable, rounded, cystic mass, not tender, should suggest the possibility of a mesenteric cyst.

**Mesenteric Thrombosis.**—Papers appear on this subject by W. J. Paul Dye,<sup>3</sup> and by S. Warren and T. P. Eberhard.<sup>4</sup> There is usually some pre-existent cardiac disease. The onset may be sudden with severe abdominal pain, bloody vomit, bloody stools, and a palpable abdominal mass. In many cases, however, the picture is simply that of an acute intestinal obstruction. It is seldom possible to distinguish between arterial embolism and venous thrombosis on symptoms; figures differ greatly as to which is the commoner. In Warren and Eberhard's series nearly all were arterial, but they worked at a cardiac clinic, and consider that in general hospital practice the varieties are about equal. Occasionally a patient has been saved by early intestinal resection, which may be survived even when very extensive.

REFERENCES.—<sup>1</sup>*Ann. of Surg.* 1934, Sept., 523; <sup>2</sup>*Surg. Gynecol. and Obst.* 1935, June, 1128; <sup>3</sup>*New Eng. Jour. Med.* 1935, Jan., 105; <sup>4</sup>*Surg. Gynecol. and Obst.* 1935, July, 102.

**MUMPS.***J. D. Rolleston, M.D., F.R.C.P.*

**SYMPTOMS.**—Cases of *primary mumps orchitis* and *meningitis* are reported by C. M. Hoogenboom<sup>1</sup> and A. Martinelli<sup>2</sup> respectively. Hoogenboom's patient was a man, aged 35, who developed right orchio-epididymitis and inflammation of the vas deferens nineteen days after his daughter had been attacked by mumps. He had had no injury to the testis and there was no evidence of gonorrhœa. Six days later his two sons showed bilateral parotitis, and the following day he developed left parotitis himself. Complete recovery took place without any testicular atrophy.

Martinelli's patient was a boy, aged 5 years, who developed meningeal symptoms with hypertension of the cerebrospinal fluid which lasted three days, and then left parotitis appeared. Six hours later the hyperæsthesia and rigidity subsided, and complete recovery took place. The neurotropism of the virus seems to have been caused in this case by the patient's being an epileptic subject.

C. B. McKaig and H. W. Woltman,<sup>3</sup> who record a personal case with a review of the literature, state that the incidence of *involvement of the nervous system* in mumps varies with different authorities from 1 to 100 per cent. It is uncertain whether the same agent is responsible for both the parotitis and the nervous symptoms, or whether the former illness activates a virus already present in the nervous system as in post-vaccinal encephalitis. The present case was that of a girl aged 16, who about a fortnight after a mild attack of mumps developed symptoms of myelitis which resulted in complete flaccid atrophic paralysis of the lower limbs. When seen six months after the onset no improvement had occurred and pyelitis had developed.

REFERENCES.—<sup>1</sup>*Nederl. Tijds. v. Geneesk.* 1934, lxxviii, 3275; <sup>2</sup>*Pediatrics*, 1934, xlii, 1452; <sup>3</sup>*Arch. Neurol. and Psychiat.* 1934, xxxi, 795.

**MUSHROOM POISONING (Mycetism).***Macdonald Critchley, M.D., F.R.C.P.*

Deaths after the ingestion of mushrooms have been known to occur since the earliest times. According to E. S. Bagnall<sup>1</sup> the victims of this kind of poisoning include the wife and family of Euripides, Pope Clement III, and the widow of Tsar Alexis. The Emperor Claudius I is often cited in illustration, but according to Tacitus the emperor was killed by the addition of some poison to a ragout of mushrooms. For many years a variety of mushroom (*Agaricus muscarius*) has been taken by the inhabitants of Siberia as a deliriant and intoxicant. L. Lewin<sup>2</sup> has given a most interesting account of this 'fly-agaric inebriety', as it is commonly called. The effects appear within the first hour or two after ingestion; an initial twitching and tremulousness of the limbs is followed by a feeling of euphoria or exhilaration. Hallucinations both auditory and visual develop, and excitement, delirium, or anxiety may occur. The pupils dilate, and may cause macropsia or an illusory magnification of external objects. In well-marked cases of intoxication the excitation reaches a frenzied pitch, in which the subject may dance or rush around until he sinks into a state of exhaustion coloured by bizarre and pleasurable phantasies. Lewin believes that the rages of the old-time Berserkers may have been due to agaric intoxication. A most curious feature of this type of inebriety is that the urine of the person under the influence of agaric also possesses intoxicating properties. As soon as the victim finds that his inebriety is decreasing he drinks his own urine, or that of another.

The literature upon the subject of accidental poisoning from mushroom is not extensive. According to Paulet,<sup>3</sup> whose paper, written in 1793, was the first treatise on the subject, there were more than 100 deaths from mushroom poisoning in Paris from 1749 to 1788. Statistics suggest that there is a marked increase in the incidence of 'mycetism'—as it is sometimes called—of recent years, due in part, at least, to the consumption of wild varieties. Owing to the depressed state of Central European countries since the War, dried mushrooms have been extensively used as food, containing, as they do, more nitrogen than meat.

In 1923, W. W. Ford<sup>4</sup> proposed the following classification of the types of mushroom poisoning:—

1. *Gastro-intestinal*.—With severe diarrhoea and vomiting. Rapid recovery is the rule.
2. *Choleriform*.—Diarrhoea and vomiting associated with severe abdominal pains, jaundice due to hepatitis, and toxic nephritis. The mortality is at least 50 per cent, delirium and coma being common terminal symptoms.
3. *Nervous*.—Initial gastro-intestinal symptoms are followed by salivation, lachrymations, and sweats. Giddiness, confusion, delirium, convulsions, and coma supervene.
4. *Sanguinary*.—Initial gastro-intestinal symptoms are followed by rapid hæmolysis causing anæmia, jaundice, and hæmoglobinuria. The mortality is low.
5. *Cerebral*.—Characterized by excitement, hallucinations, and dilatation of the pupils. Recovery is the rule, although collapse may occur.

According to a recent paper by Van der Veer and Farley,<sup>5</sup> the species of mushroom known as *Amanita phalloides* is responsible for over 90 per cent of the deaths from mycetism. Some of the other deaths are due to *Amanita muscaria*. Both grow widely in the United States, resemble closely the true edible mushroom, and possess a delicious flavour. The authors point out the fallacy of the common test for edibility of a mushroom, by noting whether or not a silver object placed in the cooking utensil becomes tarnished.

Van der Veer and Farley suggest that mushroom poisoning as it occurs in America can be divided into two main types: (1) The rapid type (mycetismus nervosus) due to *Amanita muscaria*; and (2) The delayed type (mycetismus

choleriformis) due to the various kinds of *Amanita phalloides*. In the former group the responsible toxins are muscarin and 'mushroom atropine', autonomic nervous stimulants which are antagonized by atropine. The toxins of the latter group are less well defined, but comprise 'phallin' (or *Amanita hæmolyria*) and 'amanita toxin', which is probably either an indol derivative or an aromatic phenol combined with an amine group.

Symptoms in the 'rapid' type of mycetism (due to the action of muscarin) appear within a few minutes to three hours after ingestion. They comprise salivation and lachrymation; abdominal pains, nausea, and vomiting; slow, irregular pulse; contracted immobile pupils; dizziness, confusion, with convulsions, and coma in severe cases. In fatal cases death occurs within a few hours. On the whole, however, the prognosis is good, especially if the patient is treated with atropine.

In the 'delayed' type, symptoms appear from six to fifteen hours after ingestion. There is a sudden onset of abdominal pain, nausea, vomiting, and diarrhoea; thirst; often anuria; jaundice after two or three days; cyanosis and coldness of the extremities; prostration, coma, and death from the fifth to eighth day. The mortality is severe, being often 50 to 70 per cent.

In the two fatal cases of delayed mushroom poisoning recorded by Van der Veer and Farley, autopsy revealed, in addition to acute toxic hepatitis and nephritis, widespread changes in the brain. These last were studied in detail by E. Marcovitz and B. J. Alpers.<sup>6</sup> There was marked œdema of the brain and meninges, with a widespread affection of the ganglion cells, especially in the cortex. The glial apparatus also showed considerable toxic changes. In addition to the foregoing evidences of a regressive nature there were abundant signs of a proliferative and infiltrative process. Not only were the cells of the cerebral cortex grossly affected, but also those of the cerebellum, brain-stem, and hypothalamus. The authors regard their cases as representing pathologically a non-suppurative toxic encephalitis.

Although Clark, Marshall, and Rowntree<sup>7</sup> were of the opinion that the nervous symptoms were due to uræmia rather than to the effect of any 'neurotoxin', it is probable that the cerebral changes are due to the independent toxic encephalopathy. This view is confirmed by a personal case where, following an initial period of vomiting, diarrhoea, and colic, a flaccid paralysis developed rapidly in the muscles of the shoulder girdle and upper arms. No sensory changes appeared, and the pathological process was probably in the nature of an acute toxic motor neuritis, located in the ventral horn cells of the cervical spinal cord.

W. Steinbrinck and H. Münch<sup>8</sup> said that the neurological manifestations of mycetism were of two types, central and peripheral. The former included drowsiness, spasms and convulsions, blindness, sensory disorders, and disturbances of sphincter control. Among the latter are included paralysis of the limbs with impairment of sensation. The authors attributed the last to a toxic neuritis associated with changes in the voluntary muscles.

Another case of cerebral mycetism has recently been reported by Benedek and Nagy,<sup>9</sup> in which a state of Korsakow-like delirium with meningismus succeeded a preliminary bout of vomiting and headache. The authors tend to attribute the poisoning in this case to a secondary infection of dried mushrooms by bacteria, a process which is known to liberate toxins.

REFERENCES.—<sup>1</sup>*Boston Med. and Surg. Jour.* 1914, clxxi, July 16, 111; <sup>2</sup>*Phantastica*, 1931, London; <sup>3</sup>*Traité des Champignons de France*, 1793; <sup>4</sup>*Trans. Assoc. Amer. Phys.* 1923, xxxviii, 225; <sup>5</sup>*Arch. of Internal Med.* 1935, v, 773; <sup>6</sup>*Arch. of Neurol. and Psychiat.* 1935, xxxiii, 53; <sup>7</sup>*Jour. Amer. Med. Assoc.* 1915, lxiv, 1230; <sup>8</sup>*Zeits. f. klin. Med.* 1926, ciii, 108; <sup>9</sup>*Hughlings Jackson Memorial Volume*, published by the Clinic for Nervous and Mental Diseases, Debrecen, Hungary, 1935, No. 15.



PLATE L

OPERATION FOR CHRONIC SINUSITIS

(FERRIS SMITH)

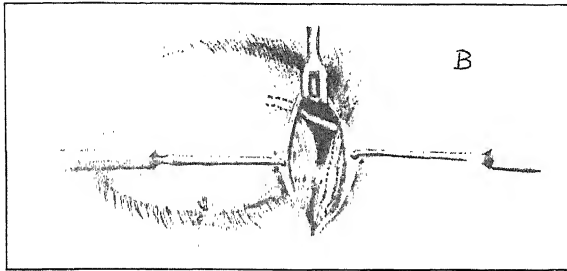


Fig. A.—Shows the exposure of the superior palpebral vessels.

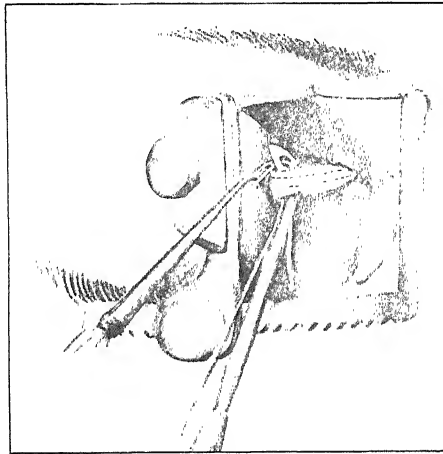


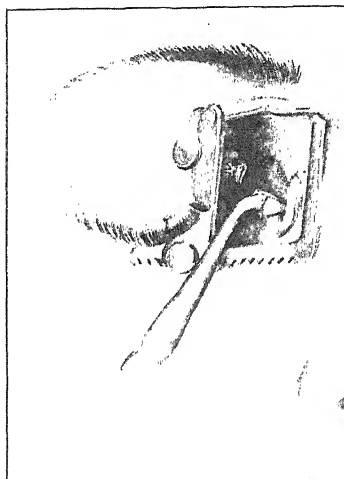
Fig. B.—Ligation of the posterior ethmoid vessels. A needle carrying 0 catgut has been passed through the periorbita posterior to the vessels, and the suture is being recovered by a sharp hook.

*Plates L-LIII by kind permission of  
'Proceedings of the Royal Society of Medicine'*

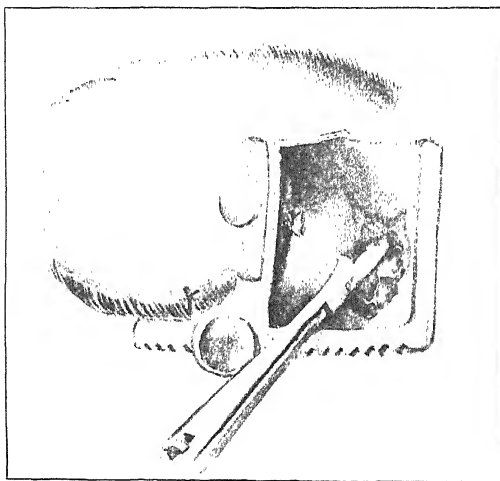
PLATE LI

OPERATION FOR CHRONIC SINUSITIS—*continued*

(FERRIS SMITH)



*Fig. C.*—Shows perforation of the lamina papyracea to admit a punch forceps.

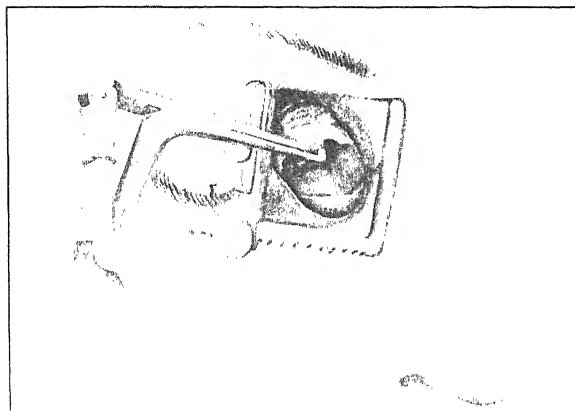


*Fig. D.*—Removal of the lamina papyracea with the punch forceps.

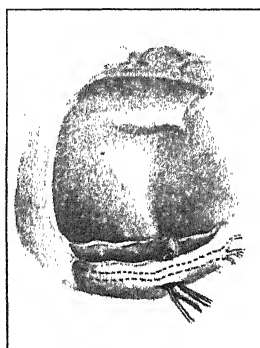
*PLATE LII*

OPERATION FOR CHRONIC SINUSITIS—*continued*

(FERRIS SMITH)



*Fig. E.*—The anterior wall of the sphenoidal sinus is being removed by a punch forceps passed through the orbital opening.

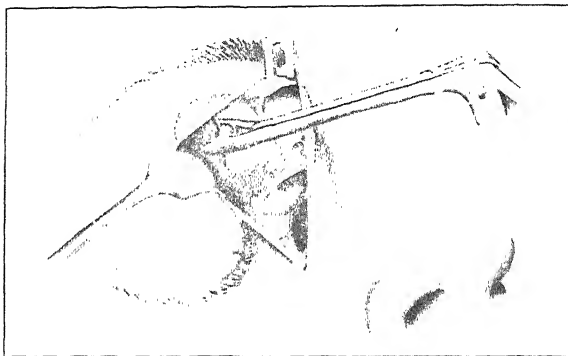


*Fig. F.*—Shows ligation of the sphenopalatine vessels near the vomer.

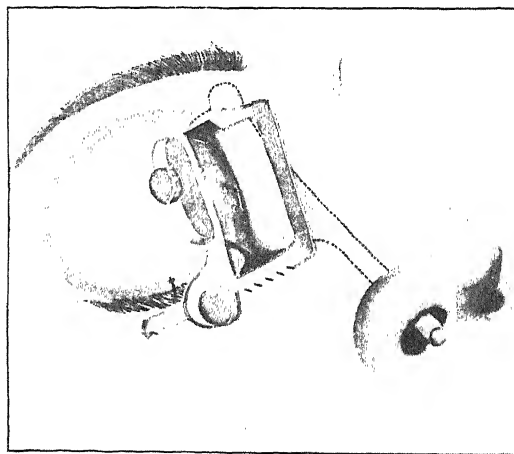
*PLATE LIII*

OPERATION FOR CHRONIC SINUSITIS—*continued*

(FERRIS SMITH)



*Fig. G.*—The floor of the frontal sinus is removed with punch forceps.



*Fig. H.*—Skin-graft supported by an inflatable rubber pad to form an epithelialized frontal duct.

**MYXEDEMA, HEART IN.** (*See HEART IN MYXEDEMA.*)**NASAL ACCESSORY SINUSES, DISEASES OF.**

*F. W. Watkyn-Thomas, F.R.C.S.*

**Chronic Infections.**—In opening a discussion at the Royal Society of Medicine<sup>1</sup> on the treatment of chronic infections of the nasal accessory sinuses, Ferris Smith said that, although there was general agreement as to the treatment of acute and subacute sinusitis, there was sharp difference of opinion as to the treatment of chronic cases. His remarks were confined to that group of chronic cases in which intelligent intranasal treatment, including conservative surgical measures designed to give drainage and ventilation, had failed to cure the condition, and where the changes in the sinuses were so advanced that no form of management could bring about a return to the normal state. The discussion was limited to the upper sinuses, frontal, ethmoid, and sphenoid, but the principles apply also to the antrum. In these chronically infected sinuses the lining is diseased, and there is often periostitis and osteitis. The object of operation must be to remove all the diseased tissue, and, as the cells lie in a dangerous area, this can only be done safely and efficiently by open operation under direct vision, and with a bloodless field.

The operation recommended by Ferris Smith is shown in *Plates L-LIII*. It will be seen that it closely resembles that described by W. G. Howarth, of which an account was given in the *MEDICAL ANNUAL* for 1922 (p. 286), but has some additional points in technique. These are: (1) Ligation of the posterior ethmoidal and sphenoidal vessels; (2) The formation of a mucoperiosteal flap to expose the floor of the sphenoid; (3) Skin-grafting of the opening into the frontal sinus.

Lowndes Yates drew a distinction between 'closed' and 'open' sinusitis. In closed sinusitis the ostia are obstructed; effective cleansing cures the majority of cases; it is only in the minority that operation is needed. When operation is needed it should be radical. In open sinusitis cleansing alone is usually adequate. Yates has devised a special irrigation pump, which he believes is an improvement on the method of Proetz (*see MEDICAL ANNUAL*, 1933, p. 311). C. Gill-Carey agreed with Ferris Smith on technical grounds. He had found that external operation gave 'extremely good' results for the ethmoid, but in many cases the results for the frontal sinus were only satisfactory for a limited period. After a year or two there was reinfection and stenosis of the opening. He had not found skin-grafting a successful remedy. In asthmatics the results were good at first, but the relief of asthma was only temporary. Here the trouble was allergic changes, not infection. W. Howarth did not agree that it is always necessary to remove all the mucosa. He, like Gill-Carey, found difficulty in maintaining the patency of the frontal opening, but his results had been improved by skin-grafting. Bedford Russell made a preliminary report on a plastic operation on the fronto-nasal duct, which consists of removing the bone enclosing the duct without encroaching on the mucosal lining. Such a method ensures patency, as the mucosa is nowhere injured. G. H. Howells agreed with Howarth that the mucosa of the frontal sinus can often be preserved. He believed that if a portion of the basal process of the maxilla is removed there is less chance of stenosis. E. Watson-Williams was opposed to total removal of the middle turbinal even in old-standing polypoid disease, and believed that mucous membranes would usually recover if the cells were drained and ventilated. Herbert Tilley doubted the practicability of performing Ferris Smith's operation under local anaesthesia in this country, and agreed that it should only be used when conservative methods failed. J. F. O'Malley suggested that osteitis was the real problem. In the antrum osteitis was rare,

except as the result of dental sepsis, but the small, cramped ethmoid cells could be compared to the cells of the mastoid.

[The points which arise from a study of this discussion are that in many cases of sinusitis treatment is unsatisfactory, and the methods are still debatable. It is clear that the operations are never without risk; that external surgery has certain advantages in safety and, perhaps, in efficiency. What is not clear is, what are the indications which make it advisable to abandon conservative measures and proceed to major surgery? Severe and unrelieved pain, definite evidence of septic absorption, or a degree of obstruction by polypi sufficient to make life a burden may be accepted as justifiable indications, but the mere presence of 'catarrh', discharge, and intermittent obstruction should not tempt us to embark on operations of a severity incommensurate with the disease.—F. W. W.-T.]

**Accessory Sinusitis in Children.**—This is attracting considerable attention. S. D. Greenfield<sup>2</sup> deals with *sinusitis in children associated with orbital complications*. He regards acute sinusitis as an "exceedingly common" complication of acute upper respiratory infections in children, and limits his remarks to those cases in children in whom there is a suggestion of extension of the infection from the sinuses into the orbit. He believes that antral and sphenoidal suppurations never cause the orbital complications which he describes, and that the cases which are said to have been caused by frontal sinusitis are really ethmoidal suppurations with secondary invasion of the frontal sinus.

Contrary to frequently expressed opinion, he points out that some ethmoid cells are present at birth, and after the second year they develop rapidly. In children the os planum of the ethmoid is more pliable than in the adult, and can be easily displaced outwards into the orbital cavity by distension of the cells; also, the orbital periosteum is easily stripped off the os planum. Thus, in children, distension of the ethmoid cells may cause compression of the orbital contents, with a corresponding rise of intra-orbital pressure. This in turn causes compression of the orbital veins and lymphatics with oedema of the lids and chemosis of the conjunctiva. The distension of the cells may be so great that the globe may be displaced downwards and outwards with apparent exophthalmos. In spite of the severity of the symptoms there is no induration and no fixation of the globe, because the condition is, clinically, extra-orbital. The presence of these two signs indicates a true orbital invasion, either by necrosis of the wall or by the blood-stream; in their absence the condition should be regarded as still amenable to nasal treatment.

In diagnosis, Greenfield places a high value on the nasal endoscope, and pays tribute to the work of Watson-Williams on this subject. He urges also the importance of radiological examination, but admits that it is difficult to demonstrate accurately the outward displacement of the lamina. Apart from tortuosity of the retinal vessels the fundus is usually normal.

In the discussion of treatment, Greenfield remarks that, although operative measures are absolutely necessary when an orbital phlegmon is present, there is a great risk of meningitis following orbital or ethmoidal operations in children. Surgery should, therefore, be the last resort in those cases in which the infection is still really confined to the sinuses. He advises the instillation of 5 to 10 min. of 3 per cent *ephedrine sulphate* into each nostril, with the head held fully extended in the Proetz position for ten minutes. This is followed by suction, which must not be strong enough to cause severe pain or rupture of the capillaries. Unfortunately the precautions against excessive suction are not very precisely described.

Cecil Cantor<sup>3</sup> finds that 67 per cent of his patients in the Children's Hospital in Melbourne have accessory sinusitis; children who always have colds are

nearly always cases of sinusitis. The discharge is mucopurulent, and crusts may form, but atrophy and *ozæna* are rarely seen. Skiagrams assist in diagnosis, but puncture and lavage are the only absolute proofs. It is widely believed that removal of tonsils and adenoids will cure most cases of sinusitis in children. There does not seem to be any reason why it should do so, and Cantor has found that it rarely does any good. As a matter of fact the history of nasal discharge and obstruction is taken only too often as an indication for tonsillectomy and removal of adenoids; this is one of the most common causes of unjustifiable tonsillectomy, and the depressing results are a matter of common observation. Otitis media is a frequent complication, and may completely mask the causal sinusitis. Bacteriological examination does not seem to be much help.

Most cases are curable by conservative treatment, such as an alkaline nasal douche and 20 per cent *argyrol*. Puncture and lavage of the antrum must usually be done also, but permanent intranasal drainage is rarely needed, and ethmoidal operations more rarely still, as treatment of the antrum usually clears up the ethmoiditis. Attention to general health is most important. It must always be remembered that in many cases the condition is infectious; in other cases the so-called 'sinusitis' is really allergic, and this side of the problem has still to be worked out.

V. Thorkildsen,<sup>4</sup> in the Polyclinic at Skien, examined in ten months 204 children of ages from 7 to 12 years, suffering from various diseases; in 128 there was nasal obstruction or rhinitis; in 16 there was chronic maxillary sinusitis, with or without ethmoiditis. The symptoms are those of chronic rhinitis, but especially unilateral, and in addition there is often headache, slight fetor, and a tendency to acute pyrexial attacks. Thorkildsen regards skiagrams as unreliable in children; asymmetry or lack of development of a sinus may give the appearance of sinusitis when there is none. He regards proof-puncture as the only certain means of diagnosis.

Bacteriological examination and a study of the blood-sedimentation tests lead him to believe that this form of sinusitis is not a true infection, but that the sinus secretions form a culture medium in which the organisms can thrive, and, although not themselves very virulent, can cause chronic inflammation of the mucosa and thus establish a vicious circle. Treatment by conservative measures, lavage, vaccines, and attention to the general health usually cures the condition. Adenoids should be removed if present. Occasionally surgical drainage of the sinuses is necessary.

*Fulminating sinusitis* is a formidable condition, and all information about it is valuable. F. Lederer<sup>5</sup> regards the essential features as swellings of the face, involvement of bone, and intracranial signs accompanying nasal sinusitis. He agrees with Turner and Reynolds that the spread to the cranium is usually by a thrombo-phlebitis. The condition is most common in children, where the walls of the sinuses are thin and the blood-supply is abundant.

When only simple oedema of the lids is present treatment should be conservative; in cases where the external swelling is greatest the general symptoms are often not so severe. If the disease advances drainage must be provided through the least damaging approach. It is probable that bad results attributed to interference in the later stages are really due to the disease, and the results would have been equally bad if nothing had been done. In osteomyelitis of the upper jaw he believes that the disease of the bone is secondary to thrombo-phlebitis; if this is correct, the cavernous sinus is already infected and surgery of the jaw is useless.

W. J. McNally<sup>6</sup> describes four cases of acute fulminating frontal sinusitis. He regards these cases as rare, if we exclude from the category cases due to injuries, such as fractures and scalp wounds, cases following the acute

exanthemata, and cases which are exacerbations of a chronic sinusitis. All McNally's patients were young, aged from 13 to 19; in three there was a previous head cold, but there was no evidence of any other nasal trouble. In all of them there was rapidly advancing œdema of the lids and forehead with severe headache, high temperature, and toxic signs. In two cases an abscess of the frontal lobe developed. All the patients recovered.

If there are signs of severe general and local reaction, the sinus should be drained externally, but with as little damage as possible to the bone and soft tissues. If there is no evidence of chronic disease, McNally does not interfere with the naso-frontal duct. Unless there is evident osteomyelitis in the anterior wall it is probably sufficient to drain through the floor; if osteomyelitis is present, the bone should be widely resected. It is probably good surgery to remove the posterior wall of the sinus at the first operation.

**Ionization.**—In view of the claims made as to the treatment of infective conditions of mucosa by ionization, particular attention must be paid to the researches of B. J. McMahon.<sup>7</sup> He found, first, that inert foreign particles, such as carbon granules, can be driven into the tissues; with ionizable solutions (silver colloids) there is a localized leucocytosis, and this is the same and of the same degree whether an ionizing current is used or not. That is to say, an ionizable solution may react spontaneously to the electric forces of the tissues without any extraneous ionization. On this hypothesis ionization has no advantages over passive contact in a mucosal-lined cavity. Definite destructive changes follow ionization, especially with zinc sulphate; these are fragmentation of epithelium, œdema, and subepithelial hæmorrhage. The general response to the galvanic current is an engorgement of the subepithelial capillaries. Diathermy causes an advantageous change without any destruction.

[These experiments were carried out on normal uninfected mucous membrane, and it is possible that in an infected mucosa the limit of resistance to the entry of ionized particles may be different. But the possibility of destructive changes must be remembered when we consider the advisability of using the method. McMahon suggests that a definite place for ionization as an intranasal method may be found in introducing vaccines and bacteriophages.—F. W. W.-T.]

REFERENCES.—<sup>1</sup>*Proc. Roy. Soc. Med.* 1935, xxviii, 963; <sup>2</sup>*Laryngoscope*, 1934, xliv, 683; <sup>3</sup>*Med. Jour. Australia*, 1935, Jan. 5, 1; <sup>4</sup>*Acta Otolaryngol.* 1934, xx, 340; <sup>5</sup>*Surg. Gynecol. and Obs.* 1935, lx, 645; <sup>6</sup>*Trans. Amer. Laryngol. Assoc.* 1934, 97; <sup>7</sup>*Ibid.* 35.

## NEPHRITIS AND NEPHROSIS. (See RENAL DISEASES.)

## NEUROSES OF WAR: THEIR PERSISTING EFFECTS.

*H. Devine, M.D., F.R.C.P.*

The Ex-Services Welfare Society, the organization started by Sir Frederick Milner, called its constituents together for a conference in London on the persisting effects of war neuroses.<sup>1</sup> Edward Mapother, who presided, said that for ten years he had been working for the society as a consultant in London, and during that time he had interviewed about 2000 patients, but he had seen little of the severer cases such as reached the mental hospital. He thought the Ministry of Pensions had steered a middle course between extravagant generosity and a too niggardly questioning of claims, and the fact that a large number of men who before the war had every prospect of full and successful lives had been left, after all possible treatment, to eke out existence on a pittance, was not a criticism of the Ministry; the criticism was rather of psychiatry. He propounded the following questions for discussion:—

To what extent are the chronic incapacities which seem to have arisen in the war really attributable to war experience, and to what extent to inherent neuropathic weakness?



Granted that at present there exist men suffering from these disabilities, what can be done, either to improve their present condition by treatment or to mitigate their lot by providing an environment to which they can adjust?

In what way and to what extent can the work of the Ministry be supplemented by unofficial organizations?

In the event of a future war, what more can be done in the light of experience to prevent the development of chronic sequels in the inevitable nervous casualties?

**Organic Conditions in Relation to Military Service.**—In Mapother's experience the organic conditions most often presenting themselves and raising the question of possible relation to military service were, during the earlier years, epilepsy, general paralysis, and alcoholism; somewhat later post-encephalitis; and in recent years premature senility and arteriosclerosis, not infrequently associated with Parkinsonism of the arteriosclerotic or degenerative type. With regard to epilepsy, it was inevitable that in a population of the age distribution of the Army epilepsy should have started during the war, but, apart from that, his own impression was that the large majority of the alleged instances of epilepsy ascribed to the war turned out to be hysteria or some form of anxiety attack, mistaken for fits or petit mal. As for general paralysis, he believed the Ministry conceded that war stress might have operated in the case of a man developing the disease in the first few years after the war. The relation of alcoholism to mental and nervous breakdown was a very large problem in the earlier years; it had shrunk in importance lately, but it was related to a still larger and more difficult question, where the outstanding change was of a moral nature, cases in which it was difficult perhaps to give a properly detached sympathy. About ten years ago many difficult problems were raised by a considerable number of men presenting themselves with what was undoubtedly post-encephalitic Parkinsonism, and some in the earliest stages of the disease obtained pensions. The passage of time had brought it about that a number of those who served twenty years ago were now suffering from premature senility. It was often hard to discover how far present symptoms were a relic of old neuroses or a product of new vascular disease.

**Functional Neuroses and Psychoses.**—Mapother's own impression was that in dealing with gross functional cases the Ministry had leaned to the side of generosity, and that most cases of schizophrenia and manic-depressive insanity now in Service hospitals would have been in much the same condition if the war had not occurred. That was quite consistent with the fact that a number of acute psychoses occurred in which war-time stress was the main factor, but he thought most of such cases cleared up. It was quite different with the relatively minor psychoneuroses. In many of these he felt that the whole condition was initiated by the war, and that men who, apart from that, would have passed their lives normally, were left with residues of their original neuroses or were sensitized so as to develop emotional disturbance with undue readiness under subsequent stress. It was possible, of course, to hold that the influence of the war had passed away, and that there was a constitutional weakness manifesting itself from time to time spontaneously or under stress. That might be true in a minority of cases, but it was illogical to take the line that neuroses must be attributable either to military service or to civil conditions, and that to qualify for pension or treatment the disability must be wholly due to military service. That was an example of the fallacy of the single cause—a fallacy rampant in psychiatry. The proof of continuity should not be too rigidly insisted on before official help was given. Many of the best type of men who had employment on discharge did not apply for pension until,

after years of struggle, they were beaten by economic difficulty. It was also possible, and in keeping with the clinical picture, and even with laboratory findings, to regard the first attack of neurosis due to war stress as sensitizing a man to similar stress in the future. Even though overt manifestations had meanwhile disappeared there persisted a tendency to break down under later stress, such as bereavement or unemployment. It was very common to find the apparent cause of the fresh breakdown an event which appeared to arise wholly out of civil life; but on a less superficial view these civil events precipitated secondary effects of the old neurosis. A neurosis, while not enough to make a man incapable of work, might be such as to rank him among those who were sacked when a season of bad trade began. It was difficult for civil regulations to take account of such remote though valid connections.

**Present-day Neurasthenia.**—By the term 'neurasthenia' Mapother said he intended an altogether more negative syndrome—in fact, an asthenic or exhaustion state the physical evidences of which were headache, insomnia, fatigability, loss of appetite, and constipation, and the mental accompaniments, lack of interest and energy, dejection, and pessimism. In earlier days anxiety neurosis was by far the most common of the war psychoneuroses, and second in frequency came hysteria. It was commonest in men of low morale, sometimes low intelligence, while the more passive or negative syndrome to which he applied the term 'neurasthenia' was at first rather rare. His impression was that localized hysterical disabilities, such as paralysis of the hand or foot, were getting rare, that even the hysterical simulations or exaggerations of anxiety states, such as tremor, staggering, or stammer, were also less common. Cases of classical anxiety neurosis did still occur, but formed a much less prominent part of the total picture than formerly. In genuine mental symptoms of the anxiety type physical signs nowadays were less marked, and formed a less reliable indication of the reality and severity of the state. On the other hand, the passive or negative sort of syndrome which he had called 'neurasthenia' was now the commonest of all, and it might be supposed that most of the cases of hysteria and anxiety neurosis had cleared up, leaving as the major part of the residue the relatively rare cases that were asthenic from the first. He did not, however, think that was the case. He believed the neurasthenia seen mostly nowadays was the type which many former cases of anxiety ultimately reached, and under civil stress many such asthenic cases would flare up again in an outburst of anxiety. If his point about change of type was true, it was important because there was a risk of injustice to the men, whose lassitude might be regarded as mere laziness, and also because this more asthenic condition now prevailing called for different conditions of treatment. As for treatment, he had never been among those who were enthusiastic for elaborate psychotherapy in war neuroses. The most positive kind of contribution that could be made in most cases was that of training out of the anergic state. The time has passed when much was to be hoped from psychological investigation into the original causal factors. For institutional treatment more than one type of provision was needed: first, for those whose disorder necessitated prolonged if not permanent care, such as the Ministry provided at Cosham and for Service patients in mental hospitals; secondly, provision for comparatively brief treatment of cases suffering from exacerbation of symptoms and unfitted for whatever life at home the stationary disability usually allowed; and, finally, provision for the later stages of war neuroses, such as an industrial colony, like that run by the society at Leatherhead, where, disabilities or liabilities notwithstanding, the men attained quite a reasonable degree of efficiency, self-respect, and contentment.

REFERENCE.—*Brit. Med. Jour.* 1935, ii, July 27, 179.

**ORIENTAL SORE.**

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

The sand-fly carrier of the *L. tropica* of oriental sore in the Punjab has been investigated by H. E. Shortt, J. A. Sinton, and C. S. Swaminath.<sup>1</sup> Sinton had found a close relationship between the distribution of the disease and *P. sergenti*, so concluded that this species should be investigated. Flies were bred for the purpose so as to exclude their being naturally infected, and fed at a temperature of about 28° C., with the result that 9 out of 24, or 38 per cent, showed full development of the organism. Three monkeys were inoculated intradermally with the gut content of infected flies, with positive results as early as the fifth day after the initial feed of the fly. J. A. Sinton and H. E. Shortt<sup>2</sup> also report a natural infection of an Indian dog with cutaneous leishmaniasis.

**TREATMENT.**—The treatment of oriental sore in 78 Punjab cases is reported on by J. D. Warma,<sup>3</sup> who, in addition to success with the usual treatment by *tartar emetic* intravenously and *berberine sulphate* by local injection into the sores, records the successful use of *vaccines* made from cultures of *L. tropica* prepared by R. Row and by J. C. Ray in 0.5- to 1-c.c. doses subcutaneously twice a week up to seven doses. With Row's vaccine 9 of 25 cases cleared up without other treatment, 13 showed only slight temporary improvement, and 3 showed none. With Ray's vaccine, of 35 cases, 25 were cured by the vaccine alone, 6 improved, and 4 showed no change, so the results were rather better with this vaccine. It is of most value in cases with multiple sores and those on the face. The vaccine is not yet available for general use.

**REFERENCES.**—<sup>1</sup>*Ind. Jour. Med. Research*, 1935, xxiii, July, 279; <sup>2</sup>*Ibid.* 1934, xxii, Oct., 393; <sup>3</sup>*Ind. Med. Gaz.*, 1934, lxix, Nov., 616.

**OSTEOMYELITIS, ACUTE.**

John Fraser, Ch.M., F.R.C.S.Ed.

In the past few years there has been a re-awakening of interest in acute osteomyelitis for various reasons. In the minds of some there has been a tendency to question the advisability of early operation, and this aspect was discussed at some length at the meeting of the British Medical Association held in Bournemouth in July, 1934. In opening the discussion on that occasion, J. Fraser<sup>1</sup> advanced a theory which is perhaps not generally accepted or approved, but which, if established, would have important bearings upon the question of treatment. Adumbrating the principle that the bone lesion is a local manifestation of a septicæmia, he suggested that it might be well to regard the focus as of the nature of a fixation abscess which played a useful purpose in providing immunity bodies which tend in some measure to overcome the general infection. He argued that, if this view were accepted, the local focus might be regarded as being in some measure productive of a beneficial action on the course of the disease. In his view there was something to be said for this conception, and therefore he recommended that operation should be limited to a procedure which secured simple drainage of the medullary cavity, and, further, that it should not be practised in the very early stages of the disease. Early operation might conceivably do harm by encouraging the extension of the disease and lessening the reaction of the individual. His procedure was to secure drainage of the medullary space by perforating the cortex in a number of places with a drill  $\frac{1}{8}$  in. in diameter, the superficial wound being left open, and the limb subsequently encased in plaster.

The late Mr. H. Tyrrell-Gray<sup>2</sup> in the course of the discussion gave his support to an even more complete degree of conservatism. He stated that for the past five years he had not operated on a single case of acute osteomyelitis, and during that period he had lost only a single case. The plan which he adopted was to concentrate upon the general infection by intravenous

injection of mercuric chloride ( $\frac{1}{4}$  to  $\frac{1}{2}$  gr.), by intravenous serum injection, and by occasional blood transfusion. When superficial abscess formation occurred it was dealt with by simple incision. Tyrrell-Gray contended that by this scheme he avoided the risks attendant upon opening up the bone, the risks of pyæmia, of sinus formation, and sequestration.

R. B. Dillehunt<sup>3</sup> discusses acute osteomyelitis as it is encountered in infants under six months old. He describes his experiences in three cases, two of which were under six weeks. He points out that at this early age the evidences of the disease are less intense than in later life, and that, though the original lesion may appear extensive, the ultimate functional result is likely to be good. Though the infecting organism was usually the *Sta. aureus*, foci of infection occasionally became sterile, spontaneous resolution might occur, and sequestra did not form. No mention is made of the source from which infection arises at this early age, and we would point out that umbilical sepsis is apparently the source of many of these early cases.

W. T. Green,<sup>4</sup> discusses pyogenic infection of bones and joints in infancy, and arrives at conclusions very similar to those expressed by Dillehunt. He decries early operation—in fact, his words are, “these cases seem to do about as well when one awaits localization and drains the soft tissue abscess only”.

Certain Continental observers are also inclined to adopt more conservative methods of treatment. M. Langer<sup>5</sup> gives a review of the more recent articles dealing with the disease, and afterwards describes his experience with four cases. He went on the principle of delaying operation until the infection had become localized, and thereafter incising the soft tissue of subperiosteal abscess when this appeared. Professor Hans Salzer<sup>6</sup> subscribes to very similar views. He believes that the high mortality associated with radical types of operation, a mortality which averages 15 per cent, is materially reduced when more conservative measures are adopted.

It is significant that the papers which have been quoted are without exception in favour of a more conservative attitude than has hitherto been adopted. The principles recommended may be summarized as follows: (1) To put the limb at complete rest; (2) To employ means which combat the general infection—sera, vaccines, or the chemotherapy recommended by the late Mr. Tyrrell-Gray; (3) To employ drainage of the affected area when pus formation appears. The advantages urged for the procedure are that the mortality is reduced and subsequent sequestration rendered less likely.

REFERENCES.—<sup>1</sup>*Brit. Med. Jour.* 1934, ii, Sept. 22, 539; <sup>2</sup>*Ibid.* Aug. 11, 272; <sup>3</sup>*Surg. Gynecol. and Obst.* 1935, lxi, July, 96; <sup>4</sup>*New Eng. Jour. Med.* 1934, cexi, July 26, 159; <sup>5</sup>*Arch. f. klin. Chir.* 1935, clxxi, April, 640; <sup>6</sup>*Wien. klin. Woch.* 1934, xlvii, Nov. 9, 1389.

## OSTEOPETROSIS.

Reginald Miller, M.D., F.R.C.P.

This condition, which is gradually establishing itself as a rare but interesting familial disease, was originally described by Albers-Schönberg in 1904 and is often known by his name; but somewhat awkwardly the same author described another and probably distinct bone disease in 1915 (osteopoikilie or osteopathia condensans disseminata). Osteopetrosis seems the most convenient title for the disease, which has also been called ‘congenital osteosclerosis’, ‘osteosclerosis fragilis generalisata’, or ‘marble bones’.

The disease may be manifest at birth, or its symptoms may not appear until later life, and in general it runs a progressive course. Either sex may be affected. The disease shows a marked familial tendency. The parents may be affected, either father or mother, and thus the disease be directly inherited in the offspring; failing direct inheritance of this kind, the parents often show, as is to be expected, consanguinity. The distribution of the bone lesions may

vary to some extent in different families, but in the same family is quite constant. R. W. B. Ellis<sup>1</sup> has recently reported fully on two brothers aged 34 and 18 months.

The lesions in the bones show radiographically as areas of greatly increased density. They appear in both membrane and cartilage bones, and the parts generally most affected are the base of the skull, the bodies of the vertebræ, and the long bones. The areas of sclerosis appear sometimes of uniform density throughout, but they may show transverse lines of rarefaction. The parts of the skeleton unaffected by sclerosis usually show some degree of osteoporosis, and the cortex of the long bones may be considerably reduced in thickness until the sclerosis spreads throughout their length. The bones are therefore abnormally liable to fracture in spite of the increased deposition of calcium in them.

Two sets of symptoms, secondary to the bone changes, are of importance, as it is usually for these that the patient comes under observation. They are due to the involvement of the hæmopoietic and nervous systems. The progressive sclerosis of the long bones gradually reduces the medullary cavity and the bone-marrow to a degree incompatible with normal blood formation. At first over-activity of the residual marrow results in an increase in reticulocytes and nucleated red cells in the peripheral blood, but later a true aplastic anæmia develops. In attempted compensation there is enlargement of the liver and spleen, and of the lymphatic glands throughout the body. The deposition of dense bone at the base of the skull results in a variety of neurological symptoms, including hydrocephalus and pressure on cranial nerves in the exit from the cranial cavity. Amongst the most common findings are optic atrophy, facial and ocular palsies, and nystagmus. There is frequently clubbing of the posterior clinoid process, and some reduction in the size of the sella turcica. It is therefore possible that some of the delayed growth and development may have a pituitary origin.

REFERENCE.—<sup>1</sup>*Proc. Roy. Soc. Med.* 1934, xxvii, 1563.

**OTITIS MEDIA.** (*See* EAR, AFFECTIONS OF.)

**OTOSCLEROSIS.** (*See* DEAFNESS.)

### OVERCROWDING.

G. E. Oates, M.D., M.R.C.P., D.P.H.

The outstanding feature of the Housing Act, 1935, is the establishment of a national standard of overcrowding. In future a house is deemed to be overcrowded if it is necessary for any two persons over ten years of age and of opposite sex (not being spouses) to sleep in one room; or alternatively, if it is inhabited by more than the permitted number of persons as set out in the Act. This number is calculated from a consideration of the number of dwelling-rooms available and the various floor areas. For each room so many human 'units' are allowed: for one room two units, for two rooms three units, for three rooms five units, and so on. A person ten years old or more constitutes a 'unit', a child over one year and under ten is half a 'unit', and no account is taken of a child under one year. If the floor area of a room is less than 110 square feet, the number of 'units' it will accommodate becomes reduced, and a room of less than 50 square feet floor area is disregarded in this connection. These standards are much in advance of those formerly prevailing and will necessitate the provision of much new accommodation for the families displaced by the operation of the new standards.

J. Fenton<sup>1</sup> finds that in North Kensington there are some 2000 to 3000 families living in overcrowded conditions, out of a total of 20,134 families.

He sums up the duty of local authorities in enforcing the overcrowding provisions into two parts: (1) prevention, and (2) abatement of overcrowding arising after and existing on the day appointed for the full operation of the new provisions. The provisions of the Act in the first respect are definite and not difficult to enforce. The landlord must take reasonable steps, when letting, to ensure that the number would not be excessive, and must notify the local authority within seven days if he subsequently becomes aware of overcrowding. The occupier will then be served with a notice requiring abatement without offering alternative accommodation, and if the offence is persisted in, the local authority may apply to a Court for vacant possession. The problem of existing overcrowding is rather more difficult. An occupier is not guilty of an overcrowding offence unless he has been offered suitable alternative accommodation—that is, housing suitable for his family, near his work, with equivalent security of tenure and at a rate within his means.

REFERENCE.—*Lancet*, 1935, ii, 862.

**PAIN, INTRACTABLE.** (*See also* ARTERIES, PERIPHERAL, DISEASES OF.)  
*Macdonald Critchley, M.D., F.R.C.P.*

**Relief from Intraspinal Injections of Alcohol.**—A. M. Dogliotti,<sup>1</sup> F. C. Yeomans<sup>2</sup>, and H. C. Saltzstein<sup>3</sup> have claimed relief in cases of intractable pain in the legs, lower abdomen, rectum, and pelvis, from the intraspinal injection of absolute alcohol. Their series of 40, 7, and 11 cases respectively, comprised chiefly patients with tabetic crises, chronic arthritis, sciatica, and—in particular—inoperable malignant disease of the spine or pelvis. The technique suggested consists in making a puncture between the 1st and 2nd lumbar vertebrae, the patient resting on the side opposite that affected. Very slowly, drop by drop, a total of 0.2 to 1 c.c. of absolute alcohol is injected through the lumbar puncture needle. The patient remains immobile for twenty minutes, and then is rolled on to his back, where he remains for two hours. It is claimed that as a result of the injection motor disturbances are slight, and that sphincter disorders are very uncommon.

Alteration in sensation and in the reflexes may be seen, however. Should the pain not be relieved in a fortnight the injection is repeated at the same spinal level, but with the patient lying on the opposite side. It is suggested that alcohol, being lighter than spinal fluid, rises and follows the exit of the spinal nerves. The relief of pain usually lasts for six months. Saltzstein states that he has encountered no ill-effects other than occasional and transient signs of spinal irritation. One case only showed bladder or rectal disturbance, and this complication may have been the result of the spinal metastases. A burning sensation is commonly complained of as the alcohol is being introduced.

REFERENCES.—<sup>1</sup>*Rev. neurol.* 1931, ii, 485; <sup>2</sup>*Jour. Amer. Med. Assoc.* 1933, ci, Oct. 7, 1141; <sup>3</sup>*Ibid.* 1934, ciii, July 28, 242.

*Ivor J. Davies, M.D., F.R.C.P.*

E. L. Stern<sup>1</sup> (New York) writes on the relief of intractable pain by the *intraspinal (subarachnoid) injection of alcohol*. The following summary is drawn from his paper. Clinical observations following 50 intraspinal subarachnoid injections of 95 per cent alcohol demonstrate that the procedure is a practical and safe one when done properly. As shown experimentally, it is dangerous to life when done improperly. Recently the author has obtained better results with the use of absolute alcohol instead of 95 per cent alcohol. Used properly, alcohol usually relieves intractable pain, and may cause only partial anaesthesia, but does not paralyse muscles. The fundamental principles of technique for the intraspinal subarachnoid injection of alcohol are given.

The procedure when successful is invaluable in the relief of chronic painful conditions. A single subarachnoid alcohol injection may give relief for as long as eight months. It obviates the necessity for using narcotics in large doses and diminishes the possibility of making drug fiends of chronic invalids. By relieving pain, it allows more intensive X-ray, radium, or other medical treatment to be given, and so tends to prolong life. There is some clinical evidence that sympathetic fibres are affected by 95 per cent alcohol when introduced into the subarachnoid space. This method therefore promises to be one of value in the treatment of disease and disorders of the sympathetic nervous system. Abstracts of 19 cases of cancer of various organs are given.

REFERENCE.—*Amer. Jour. Surg.* 1934, xxv, Aug. 2, 217.

## PANCREAS, SURGERY OF.

A. Rendle Short, M.D., F.R.C.S.

**Acute Pancreatitis.**—As has been mentioned in former issues of the MEDICAL ANNUAL, there is a school of opinion on the Continent, especially in Germany, which holds that better results are obtained by abstaining from operation. Surgeons holding this opinion include Bernhardt, Polya, Walzel, von Haberer, Hrömann, Strauss, Markus, Hüpnagel, and Mikkelsen. O. Mikkelsen<sup>1</sup> points out that there is no anatomical basis for operation; the pancreas has no true capsule to be drained, and one cannot cut the connective tissue covering of each individual lobule to relieve the tension. Direct attack is likely to produce dangerous bleeding. Drainage of the biliary passages has not reduced the mortality. During the past eight years the author has been treating the patients conservatively. Of 39 seen, 20 were extremely ill, but only 3 died; of 19 not so severely poisoned, none died. Subsequent operation was performed only when gall-stones were present. The treatment was: (1) A plentiful intake of fluid (water, tea) by mouth as far as the vomiting will permit. (2) The subcutaneous and intravenous administration of 1 litre of physiological salt solution several times daily. (3) Stimulants and, frequently also, when the blood-pressure is particularly low, *ephetonin*. (4) Peristaltics—enemas containing 2 c.c. of *sennatin* once or twice daily and, in some cases, the intravenous injection of 1 c.c. of *pituglandol* once or twice daily. [Very few British surgeons see 39 cases in eight years. The figure would suggest that other conditions may have been wrongly diagnosed as acute pancreatitis.—A. R. S.]

F. Bernhardt<sup>2</sup> describes acute pancreatitis as following a regular procession of events:—

1. The *first stage* is due to œdema of the pancreas, and is characterized by violent pain, usually radiating into the left shoulder. This stage may be recovered from without operation, and without passing on into the other stages.

2. In the *second stage*, by which time hæmorrhage, infarctions, and necrosis have developed in the pancreas, the symptoms are those of acute intestinal obstruction, in which, however, faces and flatus may be passed.

3. In the *third stage* peritonitis, or abscess formation, may be present. There are, however, some aberrant types, and the third stage may follow directly on the first. The writer claims to make a diagnosis with the same certainty as in appendicitis. The raised diastatic index, the lowered sugar tolerance (best seen in the blood-sugar curve), and the development of a leucocytosis up to 50,000 earlier than in any other acute abdominal disease, are all characteristic. In severe cases casts are present in the urine, there is a brick-dust sediment, and N retention. Bilirubin may be found in the urine.

Bernhardt advises *against operation* in the following cases: (1) Cases of lesser severity; (2) In stages 1 and 2; (3) Cases of the peritonitic type if there is marked collapse or cardiac weakness; or (4) Cases with oliguria or anuria, or marked N-retention. These last will probably die.

He advises *immediate operation*: (1) If there is a generalized peritonitis; (2) In patients with bile in the urine, where there may be a stone in the common duct; (3) If an abscess has formed. The non-operative treatment consists of maximum doses of morphia and of atropine. Nothing whatever is to be given by mouth, but plenty of fluids per rectum and intravenously. Glucose is contra-indicated; insulin may be helpful. Operation should be done under a local or general anæsthetic, not a spinal. The pancreas is not to be incised. Continuous drip saline treatment is valuable after operation. A fortnight or more after recovery, the patient's biliary system should be explored and any stones removed. Bernhard claims that by following this treatment his results are better than any previously published.

P. Brocq,<sup>3,4</sup> criticizing these opinions, says that before we can discern the relative values of intervention and abstention we must be sure that cases have been correctly diagnosed. Were the abstentionists always dealing with genuine cases of acute pancreatitis? The pathological tests on which they have relied are not always conclusive evidence. He, and French surgeons generally, believe that it is safer to drain the lesser sac of the abundant fluid which collects in it, and to provide exit for the massive sloughs which separate later. It is bad surgery to attempt to do more to the pancreas itself. Acute pancreatitis comes on at the hour of active digestion; it may therefore be worth while to give atropine to control hypersecretion. The mortality is from 30 to 50 per cent.

**Chronic Pancreatitis.**—L. Berard and P. Mallet-Guy,<sup>3</sup> of Lyons, treat the type of chronic pancreatitis which produces cirrhosis of the head of the pancreas, accompanied by icterus, by external drainage, and claim 70 per cent of cures. The operative mortality is low. One has to choose between cholecystostomy, drainage of the common duct, cholecyst-gastrostomy, and cholecyst-duodenostomy. Direct attack on the pancreas gives poor results. They prefer external drainage to anastomosis operations; drainage of the common duct is the most efficacious treatment, but it may be followed by a permanent fistula in a few cases which is difficult to deal with.

G. de Tarnowsky and P. Joseph Sarma,<sup>5</sup> of Chicago, analysing 30 cases, comment on the extreme difficulty of pre-operative diagnosis, and even at operation the condition is probably missed fairly often. The findings are enlarged liver, hard and enlarged head of pancreas, and adhesions; occasionally there is distension of the gall-bladder or dilatation of the ducts. The operation of choice is cholecystostomy. Drainage should be maintained for four to six weeks. Of patients followed up, 60 per cent were cured and 20 per cent improved. In difficult cases, drainage of the common duct is indicated.

**Pancreatic Lithiasis.**—According to T. C. Bost,<sup>6</sup> only about 107 cases are on record, and only 28 of these have been operated on. The usual symptoms are colicky pain with left-sided radiation; glycosuria, jaundice, and fatty stools are all rare. The stones show in the skiagram. At operation a characteristic crepitus is felt if stones are multiple. The results of surgical treatment are favourable:

**Cancer of the Pancreas.**—No disease sounds more unpromising for surgical treatment, but G. Gordon-Taylor<sup>7</sup> has put on record a successful case of resection of the body of the pancreas. The patient not only survived the operation, in spite of the fact that parts of the splenic artery and vein were removed, though the spleen was left behind, but he was alive and well two years later.

Sampson Handley<sup>8</sup> has treated 7 patients with cancer of the head of the pancreas with radium needles: 4 died, but 2 are alive and well, fourteen years and ten months respectively; in another, the mass completely disappeared (verified by subsequent operation) but later recurred.

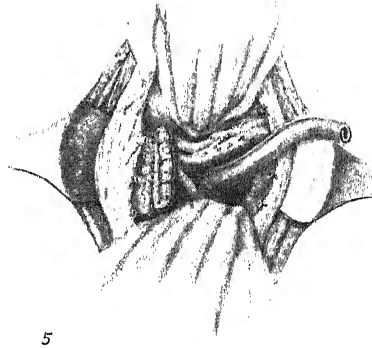
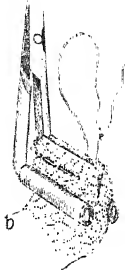
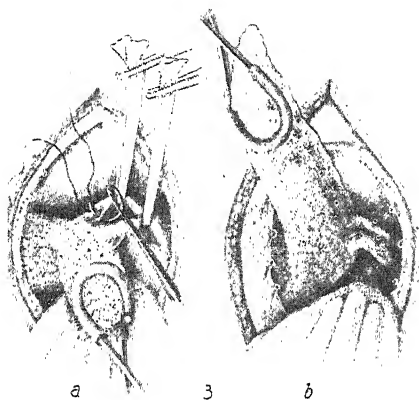
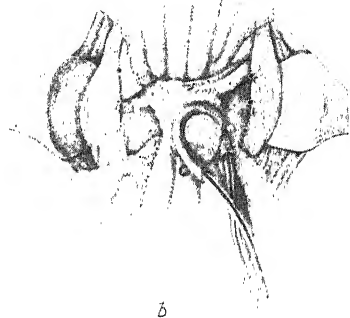
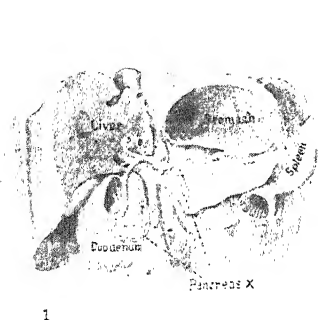




# PLATE LIV

## SUBTOTAL PANCREATECTOMY FOR HYPERINSULINISM

(J. M. McCAUGHAN)



By kind permission of 'Annals of Surgery'

**Hyperinsulinism.**—J. M. McCaughan,<sup>9</sup> of St. Louis, describes a technique for subtotal pancreatectomy to cure this condition; so far, no post-operative deaths have been reported. The abdomen is opened by a long left mid-rectus incision, and the pancreas is approached through the gastrocolic omentum, pushing the stomach up and the colon down. A bridge is used to elevate the patient's spine. The pancreas is removed from the tail towards the head. The splenic vessels are temporarily ligatured with tape to facilitate their dissection from the pancreas and the ligature of numerous small side-branches. The pancreas is divided near the head by a V incision and the stump closed by sutures. Drainage for several days is essential. (*Plate LIV.*)

#### PLATE LIV.

*Fig. 1.*—The surgical anatomy of the pancreas, modified from Spalteholz. Note the intimate relation of the body of the pancreas and the splenic vein, also the numerous tributary vessels of the splenic artery and vein.

*Fig. 2.*—*a*, The location of the incision. *b*, The exposure obtained through the gastrocolic omentum. The tail of the pancreas is drawn forward by means of a rubber-guarded Collins common-duct forceps.

*Fig. 3.*—*a*, Traction and countertraction with the temporary tape ligatures and the Collins forceps discloses the tributary vessels by placing them on the stretch. An aneurysm needle is shown introducing the ligatures. *b*, The numerous small venous and arterial branches have been ligated and divided, and the pancreas is shown dislodged from its bed.

*Fig. 4.*—*a*, The pancreas is now grasped with a rubber-covered right-angle forceps to steady it and control bleeding during the resection and suture of the stump. A v-shaped type of incision divides the body at the point of election. *b*, Suture of the pancreas with a running mattress and return lock-stitch is begun.

*Fig. 5.*—The final appearance of the operative field. The suture of the pancreas has been completed. A rubber tissue drain is placed to the bed of the excised portion of the pancreas.

**The Accessory Pancreas.**—Not very infrequently a nodule of pancreatic tissue may be found in the wall of the jejunum, and the unwary surgeon may mistake it for a growth. A few instances are recorded in which it has actually started a tumour, and one or two in which acute pancreatitis developed in the accessory pancreas. A. Rendle Short published such a case in 1913. The whole subject is reviewed by L. Ugelli,<sup>10</sup> of Rome.

REFERENCES.—<sup>1</sup>*Act. chir. Scand.* 1934, lxxv, 373; <sup>2</sup>*Zentralb. f. Chir.* 1935, Jan., 71; <sup>3</sup>*Presse méd.* 1934, Oct., 1543; <sup>4</sup>*Ibid.* 1935, Feb., 217; <sup>5</sup>*Ann. of Surg.* 1935, June, 1342; <sup>6</sup>*Amer. Jour. Surg.* 1935, July, 85; <sup>7</sup>*Ann. of Surg.* 1934, July, 206; <sup>8</sup>*Ibid.*, 215; <sup>9</sup>*Ibid.* 1935, June, 1336; <sup>10</sup>*Policlinico* (Sez. Chir.), 1934, Aug., 424.

#### PARAPLEGIA IN POTT'S DISEASE. (*See JOINTS, SURGERY OF.*)

**PARATHYROID GLANDS.** *Sir Walter Langdon-Brown, M.D., F.R.C.P.*

**Parathyroid Functions.**—G. C. Linder,<sup>1</sup> investigating the influence of infection on the action of parathormone in man, was unable to determine any general rule, but found that this hormone had little effect in raising the serum calcium in typhoid fever and in the quiescent stage of pulmonary tuberculosis, as if it were more or less inactivated under these conditions.

P. Bastai and G. C. Fogliotti<sup>2</sup> advance an interesting but not altogether convincing view of parathyroid function in connection with the blood-vessels. They maintain that partial removal of parathyroid tissue may alleviate the structural vascular changes in the earlier stages of thrombo-arteritis obliterans and diabetic endarteritis. They explain this on the observations of Kraus and Zondek that calcium ions stimulate the sympathetic, while potassium ions stimulate the parasympathetic, and claim that adrenalin is more active in a medium rich in calcium. In this way vasoconstriction is maintained at too high a level and structural changes follow. As they do not find alterations

in the parathyroids removed, they consider that the primary factor is something else which acts on these glands. In the case of diabetes they postulate an antagonism between the pancreas and the parathyroids, so that in the absence of insulin the parathyroids are over-active. They admit that this is opposed to the ordinary view (Cambridge, for instance, maintains that parathormone increases the action of insulin), and that they have found no evidence of pancreatic trouble in cases of thrombo-arteritis obliterans. They suggest a similar pathology and treatment in ankylosing arthritis and in scleroderma. Though the theory is rather far-fetched and the clinical reports are not very convincing, their paper is interesting and suggestive for fresh lines of inquiry.

In this connection it is interesting to note that A. Ferrannini<sup>3</sup> has recently confirmed Cambridge's view by finding that parathormone almost constantly reduces blood-sugar by 13 to 35 per cent, always increases carbohydrate tolerance, and behaves towards adrenalin in the same manner as does insulin.

**Hyperparathyroidism.**—D. P. Cuthbertson and W. A. Mackey,<sup>4</sup> in a comprehensive review of the whole subject of these glands, point out that in the complicated process of development from the branchial clefts modifications and errors are possible, so that it is not surprising that such great variations are observed in their so-called normal anatomy. They quote J. L. Johnson's observation made on himself that the daily injection of 50 units of parathormone produced severe pains in the bones and joints from the twelfth day, suggesting that the pains of generalized osteitis fibrosa are the direct result of increased parathyroid secretion on the bones. They consider that although parathyroid hyperplasia may be either primary or secondary it almost certainly precedes the skeletal changes in generalized osteitis fibrosa. They report three new cases of this disease, each of which was operated on. The first, a very long-standing one, died from hypocalcæmia despite intensive therapy; in the second a rapidly progressing skeletal degeneration was not entirely checked; the third did well, and five months after operation showed distinct evidence of recalcification.

F. Albright et al.<sup>5</sup> report three cases of clinical hyperparathyroidism presenting diffuse hyperplasia of all parathyroid tissue, but no adenoma. They attribute this to a parathyroid-stimulating factor in the anterior pituitary as suggested by Cushing and described by Hertz and Krancs.

A. B. Gutman et al.<sup>6</sup> report 4 new cases, 3 of which were operated on, 2 successfully. The fourth case was not operated on because of advanced renal changes and ended fatally. These 3 reports add to the rapidly accumulating evidence that hyperparathyroidism is by no means a rare disease.

**Hypoparathyroidism.**—I. Snapper<sup>7</sup> has described two cases of tetany following removal of parathyroid tissue successfully treated by the oral administration of the fraction of irradiated ergosterol known as A.T. 10. This fraction does not contain vitamin D but resembles it in raising the serum calcium. Its action is slow but prolonged. It is therefore only safe to employ it when calcium estimations can be regularly made; otherwise there is a risk of dangerous hypercalcæmia with calcification of the organs, especially of the kidney (see also W. Rieder<sup>8</sup>).

D. Campbell<sup>9</sup> recommends 150 gr. of calcium chloride daily for parathyroid tetany. In cases where this is not effective, and especially if there is achlorhydria (as there was in both his cases), 50 to 100 c.c. of N/3 hydrochloric acid should be given in milk, in the proportion of 1 of acid to 20 of milk, in order to increase the absorption of calcium.

REFERENCES.—<sup>1</sup>*Quart. Jour. Med.* 1935, April, 131; <sup>2</sup>*Presse méd.* 1934, Nov. 10, 1766; <sup>3</sup>*Polieclinico*, 1935, xlii, May, 285; <sup>4</sup>*Glasgow Med. Jour.* 1935, May, 249; <sup>5</sup>*Arch. of Internal Med.* 1934, Sept., 315; <sup>6</sup>*Jour. Amer. Med. Assoc.* 1934, July 14, 87; <sup>7</sup>*Lancet*, 1934, i, April 7, 728; <sup>8</sup>*Zentralb. f. Chir.* 1934, Oct. 27, 2482; <sup>9</sup>*Lancet*, 1935, i, 369.

**PARATHYROID SURGERY.***Sir W. I. de C. Wheeler, F.R.C.S.I.*

**Hyperparathyroidism.**—In this condition there is a high level of serum calcium and a low level of serum phosphorus. Both calcium and phosphorus are increased in the urine, and in consequence there is a predisposition to the formation of urinary calculi. Attention has not been focused sufficiently on this aspect of the formation of renal and vesical calculi. Many cases are now on record of hyperparathyroidism being the deciding factor in the formation of stones.

V. S. Counsellor and J. T. Priestley<sup>1</sup> discuss hyperparathyroidism and the present conception of renal lithiasis. They state that dysfunction of the parathyroid bodies is now definitely associated with a rather high incidence of renal lithiasis. In the opinion of these writers urinary stones associated with long disability from fractures, arthritis, etc., may have a similar etiology.

E. D. Churchill,<sup>2</sup> in a study of the parathyroids, suggests the following grouping :—

*Group 1.*—Generalized enlargement of the parathyroids due to hyperplasia but not associated with hyperparathyroidism (rickets, osteomalacia, pregnancy, nephritis).

*Group 2.*—Generalized enlargement with hyperparathyroidism.

*Group 3.*—Adenoma of one or more glands with hyperparathyroidism.

*Group 4.*—Carcinoma.

In actual practice, however, these small glands even when greatly enlarged can rarely be palpated. *Group 1* has no surgical significance and its very existence is in some doubt. Of 21 cases of proved hyperparathyroidism subjected to operation, 3 belonged to *Group 2* and 18 to *Group 3*.

F. H. Lahey and G. E. Haggart<sup>3</sup> give an interesting account and relate some of the pitfalls in the diagnosis of the condition. They stress more particularly the question of renal pathology and the responsibility of the orthopaedic surgeon when bone changes are apparent. Calculi in the renal pelvis, calculi in the tubules, and the precipitation of calcium phosphate in the kidney may be the result of hyperparathyroidism. Renal lesions may occur without evidence of changes in the skeleton. The former are an index of the severity of the disease, the latter an index of its duration. The location of the parathyroid glands is fully dealt with by these authors. They write as follows :—

“As the result of a large experience (190) with the microscopically proved parathyroids at thyroid operations and on the specimen immediately after the operation, we believe we can safely state that a parathyroid may be found at practically any position on, in, behind, or below the thyroid gland.

“The technique of demonstrating and removing parathyroid adenomata is related largely to exposure of the region where parathyroid bodies are found when typically located and a knowledge of the regions in which to search for them when parathyroid adenomata are not demonstrated in typical locations.

“The first requirement of any operation for removal of a parathyroid adenoma is exposure. This involves in our hands an adequate thyroid incision with a severing of the prethyroid muscles high between clamps. Without these muscles severed, we are not able to obtain wide exposure of the back of the gland from its lowest point up to its upper pole.

“With the muscles severed the middle thyroid veins are ligated between clamps so that the lateral vascular attachments of the thyroid to the internal jugular vein are severed. The outer border of the thyroid gland is then grasped with the thyroid grasping forceps, which we have described, lifted up, and rotated inward. The internal jugular vein and common carotid artery are completely separated from the back of the thyroid gland and the inferior thyroid artery demonstrated as a trunk where it passes behind the common carotid artery. The back of the gland is inspected for a tumour body on the

gland, and, if a tumour cannot be seen, it is palpated for such a tumour within the gland. An adenoma of a parathyroid usually converts that structure into a globular mass and changes its colour to a pale white rather than the brownish colour which characterizes the normal parathyroid.

"Parathyroids, involved or uninvolved by adenomata, are characterized by being so movable on the back of the thyroid that they are demonstrably not part of that gland. On removal they have a glistening covering, entirely surrounding the removed structure, with no area over which this shining covering is absent. This is of value in distinguishing a parathyroid adenoma from an extruded adenomatous thyroid area, in that the latter structure is usually connected with the thyroid itself by an isthmus of thyroid tissue, the severing of which in its detachment from the thyroid leaves a cut surface of thyroid tissue—interrupting thus the smooth and complete glistening capsule which is to be found in both parathyroids and parathyroid adenomata.

"Should no parathyroid adenoma be demonstrable on this exposure, the inferior thyroid artery must be completely dissected up to its entrance into the thyroid gland. The recurrent laryngeal nerve must be found and dissected up to its passage behind or in front of the inferior thyroid artery. We have found and removed a parathyroid adenoma at this point behind the recurrent laryngeal nerve and inferior thyroid artery.

"If still no parathyroid adenoma is found, one must expose the groove between the trachea and oesophagus in the region of the inferior thyroid artery. If still the adenoma is undemonstrable, the superior thyroid artery should be ligated, and the upper pole of the thyroid turned downward, so that the region where it rests against the thyroid cartilage may be inspected. In dissections at this point troublesome bleeding may arise from the ascending branch of the inferior thyroid artery, a branch of which usually nourishes the upper parathyroid. In controlling bleeding at this point, caution must be exercised, as the recurrent laryngeal nerve enters the larynx here, at the point where the lowest fibres of the inferior constrictor are inserted into the horn of the thyroid cartilage.

"In the event that the tumour is still not found, one palpates the thyroid through and through between the thumb and the forefinger and any discrete globular nodule within the gland is exposed by an incision into the gland, removed, and submitted to the pathologist for immediate frozen section report as to a possible intrathyroid parathyroid."

Lahey and Haggart summarize their most instructive communication as follows :—

"Five new proved cases of hyperparathyroidism due to parathyroid adenomata are recorded, together with the findings which led to their diagnosis.

"The clinical aspects, the blood chemistry, and the bone changes are discussed.

"The appearance of normal and abnormal parathyroids is discussed. The normal and abnormal location of parathyroids is presented in graphic form.

"The five proved cases of hyperparathyroidism together with X-rays of the bones in these cases, illustrations made at the operating table of the demonstration of the parathyroid tumours in such cases, and microscopic slides of the tumour are submitted.

"We must all, particularly the orthopedist and the urologist, be on the lookout for hyperparathyroidism in patients complaining of pain in the back or extremities, in patients with diffuse neuritis or arthritic pains made worse on motion, in patients with progressive loss in stature, and in patients with kidney stones. Many patients with hyperparathyroidism who could be relieved of their condition by surgical removal of a parathyroid adenoma, have in the

past and are doubtless still passing through our hands with their condition unrecognized."

**Parathyroidectomy for Raynaud's Disease.**—Alice R. Bernheim and J. H. Garlock<sup>1</sup> discuss disturbance in calcium metabolism in Raynaud's disease and allied conditions. Following operation they state that there were the most astonishing results in uncomplicated cases. All four parathyroid glands should be exposed. Two parathyroids are removed and subtotal removal of a third is performed. Detailed case reports are given.

REFERENCES.—<sup>1</sup>*Mayo Clinics*, 1934, 299; <sup>2</sup>*Ann. of Surg.* 1934, Oct., 606; <sup>3</sup>*Surg. Gynecol. and Obst.* 1935, June, 1033; <sup>4</sup>*Ann. of Surg.* 1935, April, 1012.

**PARATYPHOID FEVERS.** (*See also* SCARLET FEVER; TYPHOID FEVER.)  
J. D. Rolleston, M.D., F.R.C.P.

**Paratyphoid A.**—In view of the fact that paratyphoid fever A can hardly be said to have occurred in England except in the case of a few travellers on their return from abroad, the case reported by J. D. A. Gray and A. D. Gardner<sup>1</sup> is of interest. Their patient was a youth, aged 16, who contracted the disease at home without even having travelled or associated with travellers. The symptoms were typical of enteric fever. Recovery was uneventful.

**Paratyphoid B.**—V. de Lavergne and H. Accoyer<sup>2</sup> record four small outbreaks of paratyphoid B which occurred in a French battalion during the years 1928, 1932, 1933, and 1934, the total number of cases being 27; 22 had been inoculated and 5 had not been inoculated with T.A.B. vaccine. Four had a severe attack, but all recovered. The outbreaks were found to be due to contamination of the drinking-water by a defective drain.

A case of paratyphoid B with *meningo-encephalitic onset* is reported by L. Ferrabouc, R. Crosnier, and P. Guichené.<sup>3</sup> The patient was a previously healthy soldier, aged 20, who suddenly developed a meningeal syndrome accompanied by transient paresis of the right hand and loss of the knee- and ankle-jerks. The cerebrospinal fluid was normal. The symptoms lasted for five days, and were succeeded by a mild attack of enteric fever of six days' duration. Two blood-cultures revealed the presence of *B. paratyphosus B*, and twelve days after the end of the acute stage the Widal reaction for this organism was positive in 1 in 500. The writers attribute the mild character of the attack to the T.A.B. inoculations which he had had during the last two years.

REFERENCES.—<sup>1</sup>*Lancet*, 1934, ii, 21; <sup>2</sup>*Rev. d'Hyg.* 1935, lvii, 421; <sup>3</sup>*Bull. Soc. méd. Hôp. de Paris*, 1935, li, 977.

**PAROTITIS, SECONDARY.**

Sir W. I. de C. Wheeler, F.R.C.S.I.

This is a rare but often fatal complication of a major surgical operation. If suppuration occurs in acute secondary parotitis the outlook is very grave. D. J. Leithauser and M. O. Cantor<sup>1</sup> state that the literature reveals that when open drainage is employed the mortality is approximately doubled. Suppuration usually occurs when the gland is enormously swollen and under considerable tension. When once well developed daily aspiration through a large calibre needle is indicated. Leithauser and Cantor recommend the administration of *Lugol's solution* in cases of acute secondary parotitis. They state that when an organ is active in the elimination of a drug, that drug, if it has an antiseptic action, is frequently found to be beneficial in combating infection of the organ. Iodine is promptly and rapidly eliminated by the parotid gland. About 15 min. of Lugol's solution every three hours is suggested, but the dose is variable. The paper concludes as follows: (1) Acute secondary parotitis has a mortality of over 35 per cent; (2) Ten cases of acute secondary parotitis are reported

which were treated with Lugol's solution, administered orally and by hypodermoclysis in saline; (3) Two cases went to abscess formation; (4) There were no deaths; (5) These results justify the use of Lugol's solution in the treatment of acute secondary parotitis.

REFERENCE.—*Ann. of Surg.* 1935, May, 1171.

### PELLAGRA.

*Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

Pellagra in the Sudan is discussed at length by N. L. Corkill,<sup>1</sup> who regards it as a major endemic disease among the Sudanese Arabs, whose staple cereal diet is millet. A marked seasonal difference in the relative proportions of millet and milk was noted, and a biological protein value below Wilson's critical value of 43 grm. was found to be associated with the pellagra season, and there was also a marked deprivation of the food sources of vitamins A, C, D, and the food sterols at the same season of the year. The writer considers pellagra to be an allergic disease to which deficiencies of A and C vitamins and cereal toxamins contribute, and that vitamin D is the anti-dermatitis vitamin. The most important physical signs are pigmentation of the cheeks and forehead, a 'sulphur-flaking' appearance on the face, and blue or black patches on gums and tongue. Mental disorders are frequent in advanced cases. He suggests that "the control of pellagra in the Sudan is a matter of increasing the cultivation of certain vitamin and phytosterol-yielding crops whenever possible." These include bulrush millet and sorghum, while maize cultivation should be discouraged. In addition the consumption of carrots, tomatoes, sweet potatoes, green vegetables, limes, oranges, and papaya should be encouraged.

I. Sabry,<sup>2</sup> working in Egypt, claims to have shown that pellagra is "caused by a toxin whose chemical formula is a dioxyphenylalanine or dopa", and this is "oxidized by the basal cells of the skin to the harmless non-toxic substance melanin." He goes on to argue at length that pellagra and pemphigus are very intimately related, and both are amenable to treatment by *thiosulphate* intravenously, although unfortunately two of his four pemphigus cases ended fatally.

In Malaya J. V. Landor and R. A. Pallister<sup>3</sup> report the occurrence, particularly in institutions, of eczema of the scrotum and angles of the mouth, combined with superficial glossitis, followed later by degeneration of the spinal cord and poor vision, which in its early stages is cleared up by the administration of vitamin B<sub>2</sub>, G, or the PP factor, so they regard the condition as being most closely allied to pellagra.

REFERENCES.—<sup>1</sup>*Jour. Trop. Med. and Hyg.* 1934, xxxvii, 196, 214, 231, 245, 265; <sup>2</sup>*Ibid.* 225; <sup>3</sup>*Trans. Roy. Soc. Trop. Med. and Hyg.* 1935, xxix, July, 121.

### PENIS, SURGERY OF.

*Hamilton Bailey, F.R.C.S.*

**Persistent Priapism.**—The principal causes of persistent priapism are; (1) Lesions of the central nervous system; and (2) Thrombosis. Injury, arteriosclerosis, and certain blood diseases, notably leukaemia, constitute the main exciting causes of the latter group. The reviewer encountered an extravagant case this year in a young man where the priapism had persisted for two months. A complete investigation revealed no cause for the condition. According to F. Hinman,<sup>1</sup> 85 per cent of cases belonging to the nervous group last under ten days; those due to thrombosis last much longer, and as the condition is painful and untouched by any form of treatment by application or medicine, surgical measures must be invoked. Many cases respond to aspiration of the corpora cavernosa as described in the MEDICAL ANNUAL of 1933 (p. 336). When this fails, incision of the corpora with truly aseptic ritual must be carried out. After clearing out any clots and evacuating the tarry blood the incision is closed with glove drainage. If care has been taken



to avoid the artery traversing the middle of each corpora there is no particular tendency to hæmorrhage, as might be expected after an incision into the cavernous tissue. Lewis (quoted by Hinman) cured one case of priapism which had lasted for two years by ligation of both dorsal arteries to the penis.

J. S. Kessell<sup>2</sup> describes a case of priapism due to secondary carcinomatous infiltration, the primary being situated in the bladder.

**Circumcision.**—J. A. Smiley<sup>3</sup> uses an anchor dressing after circumcision. Four sutures of medium catgut are passed at equal distances from each other through the skin and mucous membrane, and tied. A strip of gauze soaked in acriflavine emulsion is then anchored by means of the long ends of the original sutures. The dressing falls off in four or five days, leaving a perfectly clean wound. In order to work in a bloodless field, this author recommends a penile tourniquet.

**Cancer of the Penis.**—K. W. Horn and R. M. Nesbit,<sup>4</sup> in reporting 37 cases of carcinoma of the penis, draw attention to the importance of precarcinomatous lesions, notably venereal warts, and scars resulting from healed chancres and chancroids. The average age of the patients was 57 years. These authors also found that cancer of the penis is not infrequent after circumcision performed in middle-aged men. They stress that when a circumcision wound in an adult does not heal within a reasonable time the lesion should be regarded as potentially malignant and treated accordingly.

I. Grabcenko<sup>5</sup> finds that surgical treatment is superior to radium therapy. Cancerous inguinal glands are only slightly sensitive to irradiation.

R. C. Graves<sup>6</sup> insists that the usual carcinoma of the penis is not a radio-sensitive tumour and that it is not safe, as a rule, to place reliance for a cure upon radium and X rays alone. He believes that only the smallest and most superficial lesions should be treated exclusively by these agents, and even in such early cases the glands in the groin require the closest scrutiny.

A. L. Dean<sup>7</sup> reviews 120 cases of carcinoma of the penis treated at the Memorial Hospital, New York. While no case occurred in patients circumcised in infancy, in many cases the patient had been circumcised later in life, i.e., from two to twenty-four years before the appearance of the neoplasm. The only case reported in the world's literature of cancer of the penis occurring in a Jew was in a patient who was uncircumcised (Wolbarst, quoted by Dean). The average time the symptoms had been present before reporting to the doctor was fourteen months. The flat type of cancer occurs somewhat more frequently than the papillary. The two types seem to grow at the same rate, but the flat tumours metastasize earlier. At the time of the first examination enlargement of the inguinal lymphatic glands was present in 76 per cent of cases. In half these the enlargement is due to carcinomatous infiltration; half are inflammatory.

M. F. Campbell,<sup>8</sup> speaking of post-operative treatment of carcinoma of the penis, says the chief requisite is to prevent a stricture, the tendency to which is always evident in cases of urethral transplantation.

REFERENCES.—<sup>1</sup>*Principles and Practice of Urology*, 1935; <sup>2</sup>*Jour. of Urol.* 1934, xxxii, 213; <sup>3</sup>*Practitioner*, 1934, cxxxiii, 336; <sup>4</sup>*Ann. of Surg.* 1934, c, 480; <sup>5</sup>*Vestnik Cjir.* 1933, lxxxvii, 222; <sup>6</sup>*Jour. of Urol.* 1934, xxxii, 501; <sup>7</sup>*Ibid.* 1935, xxxiii, 252; <sup>8</sup>*Amer. Jour. Surg.* 1935, xxviii, 55.

## PERICARDITIS, SUPPURATIVE. Sir W. I. de C. Wheeler, F.R.C.S.I.

This condition is frequently missed. In the MEDICAL ANNUAL for 1934 (p. 387) attention was called to the fact that if unrecognized the outcome was fatal, but with early drainage more than half the cases can be saved. The primary focus may be difficult to locate, but septic pericarditis may arise directly from pneumonia and empyema and occasionally may complicate such obvious conditions as osteomyelitis. Suspicion should be aroused by precordial

pain, dyspnoea, and cyanosis. X-rays are helpful, and the presence of pus can sometimes be revealed by an exploring needle passed cautiously at the left costal xiphoid angle. Free drainage is indicated. The pericardium is exposed by removal of two costal cartilages and lateral deflection of the pleura. The reviewer suggests that if the pericardium is found distended with pus, a Kidd's trocar and cannula (used for suprapubic bladder drainage) should be inserted. Through this cannula a tight-fitting tube can be passed without allowing pus to escape. A spigot is placed in the end of the tube and small quantities of pus are allowed to escape at intervals of some hours. Gradual decompression appears indicated here as elsewhere in accordance with the rule: "When an organ or system is suffering directly from pressure effects or indirectly from back pressure, the greater the pressure the more gradual should be its relief" (Wheeler).

G. H. Bunch<sup>2</sup> gives his views on suppurative pericarditis. He says the incidence of the disease is undoubtedly much greater than the less than 200 cases (operative) reported in the literature up to this time indicate. "No serious disease is so frequently overlooked" (Osler). Bunch states that when there is an enlarged area of precordial dullness shifting with change of position, and when X-ray examination shows a water-bottle shadow with the base below, there is present a pericardial effusion.

"The treatment of suppurative pericarditis is adequate dependent drainage by open operation as soon as the diagnosis is made. This is best done under local anaesthesia. It is easily accomplished and it is safe. There is so little shock that it is but little more than a minor procedure. The approach to the pericardium should be through the interpleural space, the so-called triangle of safety. This is behind the sternum and is pictured as extending irregularly to the left. The apex is above, at about the level of the fourth costal cartilage, and the base is below at the level of the base of the xiphoid. The space varies with the size of the heart and is somewhat larger in pericardial effusion. In my cases I have made a hockey-stick incision along the left sternal margin and by resecting the sixth costal cartilage have exposed the pericardium which is greyish in colour and thicker than the normal pleura. At this level if the incision into the pericardium is made near the sternal margin it will usually miss the left pleura and will be median to the internal mammary vessels, which may, if necessary, be retracted laterally or ligated and divided. We have drained every case with a wick of folded rubber dam extending into the pericardium and secured with a safety-pin through the skin. The soft wick keeps the drainage tract open without irritating or injuring the heart. We have not irrigated the wound. Pulsation of the heart ensures drainage of the pericardium if no encapsulated pus pockets are present. This is facilitated by posture if the patient is kept on a back rest. No patient not moribund is too sick for operation. The hope of cure is in early drainage. Paracentesis is essentially a diagnostic and not a therapeutic procedure. After pericardiotomy, if septic symptoms continue or return after improvement has begun, an encapsulated pus pocket should be sought for in the posterior pericardium or in the pleura. Left undrained such a pocket will surely kill the patient. We have gone a long way since Stone, in 1919, reported having done autopsies on 72 cases of pyopericardium, none of which was operated upon."

REFERENCES.—<sup>1</sup>*Med. Annual*. 1931, 507; <sup>2</sup>*Amer. Jour. Surg.* 1935, xxxviii, June, 613.

## PERITONITIS.

*A. Rendle Short, M.D., F.R.C.S.*

TREATMENT.—In the treatment of diffuse peritonitis following appendicitis, salpingitis, or leakage from the stomach or intestines, R. J. Behan,<sup>1</sup> of Pittsburgh, speaks enthusiastically of the value of intra-abdominal lavage with *ethyl alcohol*,

which has reduced his mortality from 50 to 4 per cent in 42 cases in which it was employed. He uses about 100 c.c. of 70 per cent alcohol. The value is due, in his opinion, partly to bactericidal action, partly to precipitation of protein and increased vascularization of the serous surfaces. [As so often when an observer reports that some new treatment has effected a great reduction in mortality, the 50 per cent figure is abnormally bad and the 4 per cent abnormally good.—A. R. S.]

M. G. Breitmann,<sup>2</sup> of Moscow, discussing the problems of drainage in suppurative peritonitis, advises wrapping up the drainage tube, if possible, in omentum to prevent adhesions.

J. R. Buchbinder,<sup>3</sup> of Chicago, believes that the surgical treatment of peritonitis, apart from administering fluids, glucose, and chlorides, and the use of the Levine tube, should be limited to removal of the source of the sepsis (gangrenous appendix, leaking ulcer, etc.), and aspiration of exudate.

**Pneumococcic Peritonitis.**—C. Scaravelli,<sup>4</sup> of Ravenna, argues in favour of early drainage and the intraperitoneal administration of anti-pneumococcus serum. He saved 3 cases and lost 2.

REFERENCES.—<sup>1</sup>*Amer. Jour. Surg.* 1934, July, 28; <sup>2</sup>*Ann. of Surg.* 1935, Feb., 662; <sup>3</sup>*Surg. Gynecol. and Obst.* 1934, Sept., 485; <sup>4</sup>*Policlinico*, 1935, May, 979.

#### PHARMACOLOGY AND THERAPEUTICS. (See THERAPEUTICS.)

#### PHLEBOTOMUS FEVER. *Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

In a note on laboratory investigations on sand-fly fever in India, H. E. Shortt, L. T. Poole, and E. D. Stephens<sup>1</sup> record that the blood of cases on the North-west Frontier, when sent to the hill station of Kasauli, produced typical infections in volunteers inoculated subcutaneously with it, together with a successful second passage. Whole fresh blood, citrated whole blood that had been glycerinated, and filtrates of blood induced infection on inoculation, and monkeys also appear to have been infected, and their blood in turn was infective to man and to other monkeys. Sand-flies fed on cases on the frontier also infected man in Kasauli. In a further paper H. E. Shortt and E. D. Stephens<sup>2</sup> report that patients infected with sand-fly fever appear to possess some degree of immunity in the next fever season. The dried serum of sand-fly fever cases was also infective.

REFERENCES.—<sup>1</sup>*Jour. R.A.M.C.*, 1935, lxiv, Jan., 17; <sup>2</sup>*Ind. Jour. Med. Research*, 1935, xxiii, July, 271.

#### PILONIDAL CYSTS.

*Sir W. I. de C. Wheeler, F.R.C.S.I.*

The pathogenesis of these cysts is unsettled. A number of writers regard the lesion as a sequestration dermoid, an epithelial downgrowth. Others attribute the cyst to a lack of closure of the lower neurenteric canal. It is certain the lesions are of congenital origin. No cases have been reported in negroes. They are much more common in males than in females. The patient notices a thin serous discharge and may extract protruding hairs from the orifice. Inflammation in and around the cyst often brings the condition for the first time to the patient's notice. Pilonidal cysts have received attention in the MEDICAL ANNUAL in previous years (1933, p. 349; 1934, pp. 130, 353; 1935, p. 99).

A recent article by L. K. Ferguson<sup>1</sup> discusses some of the points mentioned above. In early cases a tender swelling is present over the lower sacrum in the mid-line between the folds of the buttocks. There may be one or several openings. Pus or hair may be seen protruding through the orifice. If hair is seen, the diagnosis is certain. Otherwise the condition may be confused with the external orifice of an anal fistula. The orifice of a pilonidal sinus is smooth, in the mid-line, situated behind the anus, and lined by skin. The orifice of an

anal fistula is rarely in the mid-line and is marked by a ring of recent or old granulation tissue. A probe will pass upwards over the posterior part of the sacrum. When there is acute inflammation the mid-line position lessens the likeness to an ischio-rectal abscess, and furthermore rectal examination is not associated with pain and tenderness as it is in ischio-rectal abscess.

Ferguson compares the results of excision and drainage, excision and packing, and excision with primary suture in ambulatory cases. He recommends the last. When excision of the cyst with primary suture was employed under local anaesthesia the results were admirable. Ferguson lays down certain rules: (1) Operation should not be performed in the acute stages. The orifice is dilated, a wick drainage introduced and the excision postponed for some weeks. Occasionally a small incision will be required. (2) An incision is made round the orifices, but as little skin as possible should be sacrificed; fat to fill up the resulting cavity after excision should also be spared. (3) One per cent novocain solution is used with a liberal addition of adrenalin. (4) The entire cyst must be removed. This is rendered difficult as there is no definite capsule. The body of the cyst often extends upwards on either side of the mid-line. (5) Primary suture is employed, taking care to obliterate all dead spaces. The dressings should be copious so as to produce pressure on the operated area. They are held in position by adhesive straps transversely across the buttocks. During their application the buttocks should be held together by an assistant. The patient should lie on his back for an hour after operation. (6) The skin sutures should be removed on the third or fourth day. They predispose to infection. The steps of the operation are shown in *Plates LV-LVII*.

REFERENCE.—*Ann. of Surg.* 1935, Jan., 469.

#### PITUITARY BODY. (See also INTRACRANIAL TUMOURS; SEX HORMONES.)

*Sir Walter Langdon-Brown, M.D., F.R.C.P.*

**Anterior Lobe.**—The multiplication of hormones attributed to the anterior lobe of the pituitary proceeds apace. It may be well first to refer to the principal recent observations and then to offer certain general criticisms on the whole position.

**Growth Hormone.**—In view of the former acute controversy between those who attributed diabetes insipidus to a defect of the posterior pituitary and those who attributed it to a mid-brain lesion, it is interesting to note that G. Campailla<sup>1</sup> reports a case of acromegaly in a woman of 57 in whom the pituitary was entirely normal, but who had a syphilitic lesion in the mid-brain. This reinforces the close connection between the glandular and nervous elements in the diencephalo-pituitary apparatus. That anterior pituitary extract can lead to gigantic growth in rats has again been confirmed, reminding us of H. G. Wells's anticipation in *The Food of the Gods*. At the other extreme various authors have adopted Brugsch's label of 'acromiery' (to express the converse of acromegaly), and have recorded examples of dwarfism, infantilism, and progeria associated with anterior pituitary defects.

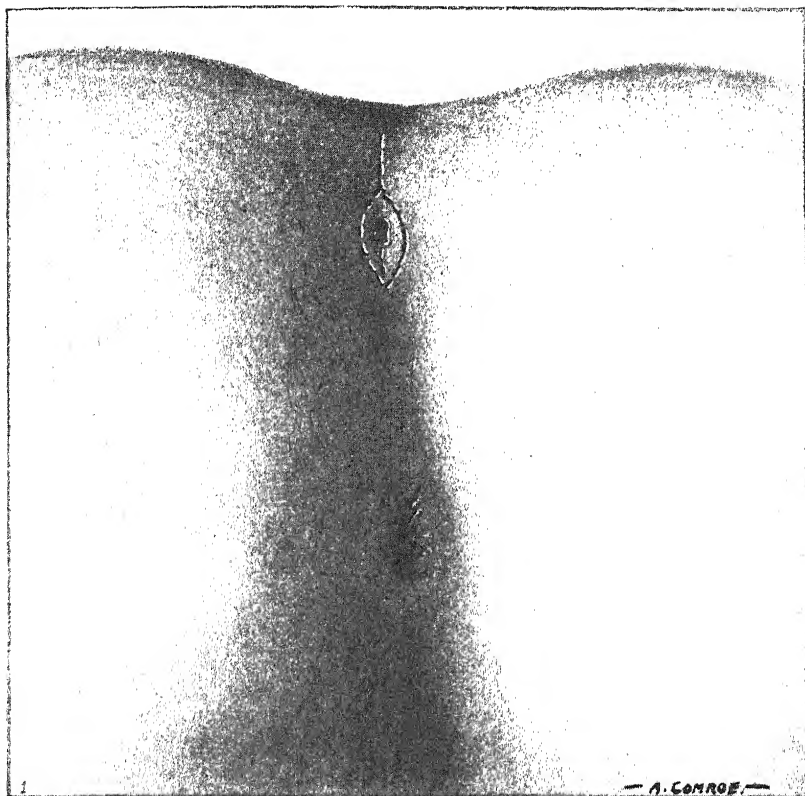
E. Novak<sup>2</sup> emphasizes the fact that as yet the growth hormone has not been obtained free from all others, and repeats Evans and Reichert's caution that admixture of the gonadotropic principles might excite sexual maturity with epiphyseal closure and thus defeat the object in view.

**Gonadotropic Hormone.**—Here the evidence is more involved. We must distinguish clearly between 'oestrogenic' substances which can act directly in the absence of the ovaries and 'gonadotropic' principles which act indirectly by exciting the production of oestrin in the ovary. J. B. Collip<sup>3</sup> maintains that while injections of the pituitary gonadotropic hormone can produce both maturation of the ovarian follicles and their subsequent luteinization in the

PLATE LV

PILONIDAL CYST

(L. K. FERGUSON)



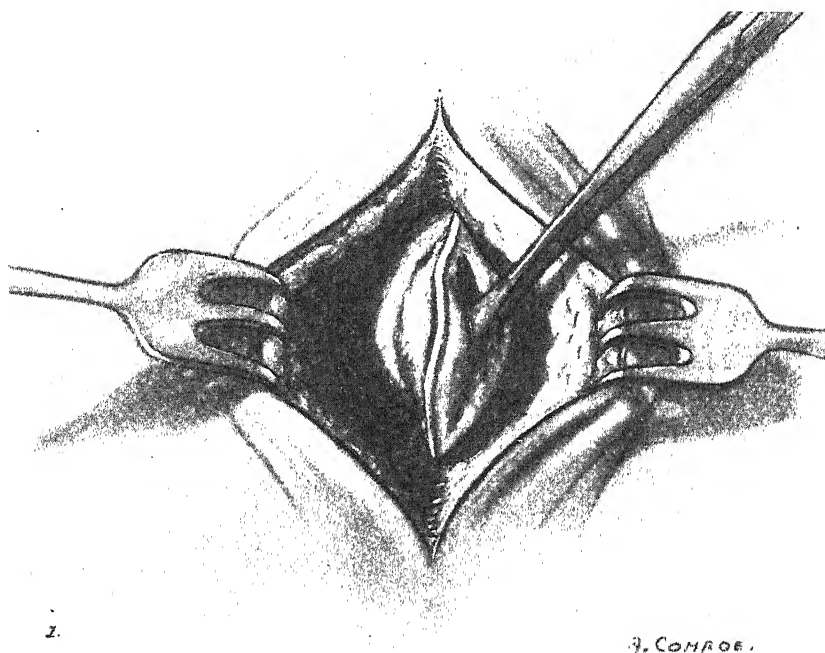
*Fig. A.*—The patient is placed on the abdomen with a pillow under the pelvis, or the operation may be performed on the proctoscopic table partially tilted. A superficial and deep infiltration anesthesia with 1 per cent novocain-adrenalin is used. The incision should be in the mid-line except where it surrounds the openings of the cyst.

*Plates LV-LVII by kind permission of 'Annals of Surgery'*

PLATE LVI

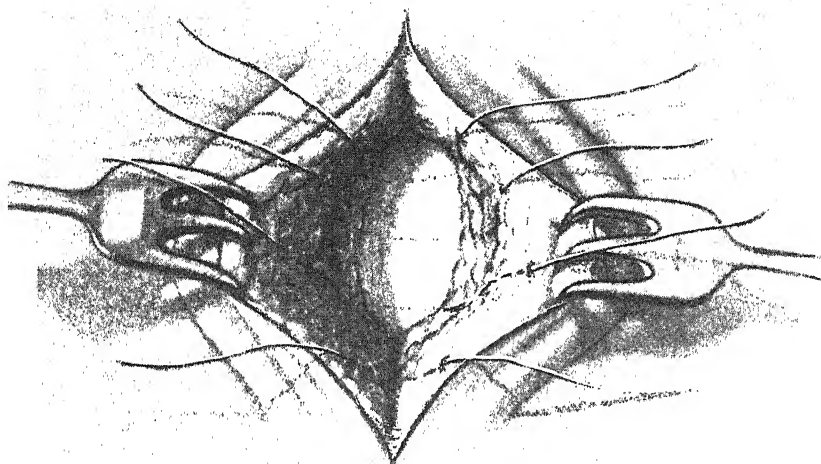
PILONIDAL CYST—*continued*

(L. K. FERGUSON)



*Fig. B.*—The sinus-like lower part of the cyst is dissected free, the tissues being kept on tension between the lateral rake retractors and the cyst opening held in an Allis forceps.

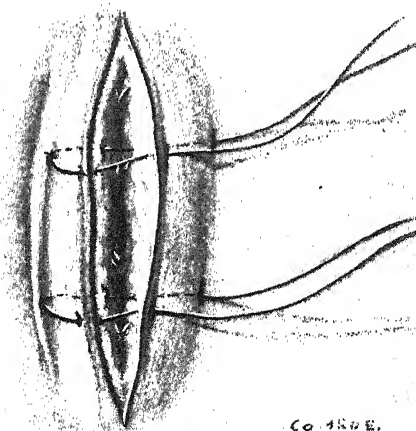
*PLATE LVII*  
PILONIDAL CYST—*continued*  
(L. K. FERGUSON)



2.

A. COMBEE.

*Fig. C.*—The cyst has been excised, exposing the dense tissue on the posterior surface of the sacrum. The depths of the wound are closed with buried interrupted sutures of fine catgut. These should effectively obliterate dead space by catching the sides of the wound and the dense tissue over the sacrum. All the sutures should be inserted before any are tied.



3.

COMBEE.

*Fig. D.*—Dead space is further obliterated by closure of the skin, using vertical mattress sutures of silk.





absence of the pituitary, the one extracted from pregnancy urine or the placenta cannot do either under such conditions. He sums up in favour of the existence of two separate pituitary hormones, one follicle stimulating, the other luteinizing, but there seems to be a growing consensus of opinion in favour of one such hormone acting at different stages in the cycle.

H. M. Evans<sup>4</sup> states the case thus: At the menopause and in pregnancy the body fluids contain types of gonadotropic hormone that are similar to, if not identical with, types that can be secured by chemical treatment of the pituitary gland. Combinations of either urinary component with the complementary gland component behave synergically. He regards the pregnancy gonadotropic hormone obtained from the urine as chorionic in origin.

Follicle-stimulating urine together with its pituitary synergist stimulates the seminiferous tubules, but not the interstitial tissue, in hypophysectomized rats.

Gonadotropic therapy in amenorrhœa has been on the whole disappointing; this has been largely due to the almost exclusive employment of the urinary extract, without the pituitary synergizer.

The Aschheim-Zondek test has yielded outstanding service in the recognition of extra-uterine pregnancy. In the toxæmias of pregnancy strongly positive results have been obtained by this test in the last third of gestation. Extraordinarily high titres are also found in hydatidiform mole and chorionepithelioma. At birth the gonadotropic hormone disappears promptly from the maternal urine. In the same way it should disappear after removal of a mole or of the uterus for chorionepithelioma; failure to do so is a sure sign that metastases have already formed.

*The gonadotropic hormone and cryptorchidism:* R. H. Kunstadter and L. S. Robins<sup>5</sup> treated 3 cases of cryptorchidism and 3 of genital hypoplasia successfully with *antuitrin S*.

S. B. Aberle and R. H. Jenkins<sup>6</sup> produced descent of the testes in 2 out of 4 boys treated with injections of anterior-pituitary-like principle from pregnancy urine. In immature monkeys this acted with complete success in one and was only partially successful in four. Failure may be due to inexact dosage or, in man, to mechanical obstruction and developmental irregularities.

Novak<sup>2</sup> quotes an extraordinary case of Cohn's in which an injection of antuitrin S was followed by descent of the testis within six hours, but he also quotes an experiment on a monkey where the anterior-pituitary-like hormone produced sufficient prostatic enlargement to cause urethral obstruction, which indicates caution in its clinical use. In view of the tendency of preparations of anterior pituitary-like substances to deteriorate, some clinics prefer to prepare their own material from pregnant urine or even to infuse the urine itself into the rectum, with apparent success.

*Pituitary Basophilism.*—Cases of this syndrome continue to accumulate, and may be considered next, as its association with the gonadotropic hormone has been stressed by Cushing and others.

C. A. Wright,<sup>7</sup> in describing some cases of pituitary basophilism, reports the presence of excess of anterior pituitary sex hormone in the urine. A case treated by *X rays* to the pituitary fossa showed marked improvement.

W. Susman,<sup>8</sup> in a series of 260 pituitaries, found adenomata in 8 per cent, 3 per cent of which were basophilic. He considers, therefore, that they are too common to be of any special significance, and that his results lend no support to the view that these basophil cells secrete a sex hormone, or that their increase will give rise to the syndrome known as pituitary basophilism. Herein he is in conflict with most other observers.

D. S. Russell, H. Evans, and A. C. Crooke<sup>9</sup> describe two cases of basophil adenoma in which the usual features of the 'basophilic' syndrome were

imperfectly manifested, the salient feature being cardiovascular hypertrophy. Nor was there any abnormal invasion of the posterior lobe by basophil cells, which Cushing has suggested may be a potent factor in essential hypertension. On the other hand, I. Pardee,<sup>10</sup> in reporting two cases of pituitary basophilism, both occurring in men and verified post mortem, supports Cushing's suggestion.

J. H. Lawrence and H. M. Zimmermann<sup>11</sup> report another case of pituitary basophilism in a man, which presented several unusual features. The adenoma was degenerate as if its activity was burned out. There was a large accumulation of colloid in the pars intermedia, and basophilic infiltration in the posterior lobe. Adenomata were also present in the adrenals and in one of the parathyroid glands. Each of these accessory adenomata has been observed separately once, but never before in conjunction. There was well-marked decalcification of the skeleton and calcification of the arteries (although the patient was only 44), but no alteration in the blood calcium. This decalcification with bone pains, yet a normal blood calcium, appears to be typical of Cushing's syndrome.

*Thyrotropic Hormone.*—J. B. Collip<sup>12</sup> adduces additional evidence for the entity of this hormone, and E. F. Scowen and A. W. Spence<sup>13</sup> have produced thyroid hyperplasia, exophthalmos, and adrenal hypertrophy by the prolonged administration of an acid extract of anterior pituitary substance.

*Parathyrotropic Hormone.*—Collip<sup>12</sup> has collected the not very convincing evidence in favour of this hormone. Although the case for its identity is by no means established, there is the striking similarity of the decalcification and bone pains of pituitary basophilism and hyperparathyroidism, despite the fact already stated that in the former the blood calcium is not increased as in the latter.

*Adrenotropic Hormone.*—Adrenalectomized rats can be made to grow by adequate amounts of cortical hormone, but not if the pituitary has been removed also; implantation of anterior pituitary tissue or injection of its extracts causes marked hypertrophy of the adrenals. In one case an acromegalic girl suddenly developed hirsutism, interpreted as an adrenal effect.

*Lactogenic Hormone.*—Further evidence is being adduced in favour of a special hormone governing the formation of milk as apart from the expulsion of milk through the mammary ducts. According to P. E. Smith<sup>14</sup> this prolactin (or galactin) does not cause the development of the mammary gland, but it does cause the onset and continuation of the secretory phase, while the oestrogenic hormone causes an unfolding of the mammary duct system even in the fetus; the cessation of the latter secretion at birth followed by a temporary prolactin secretion by the infant's pituitary would seem to explain the long-debated phenomenon of witch's milk. (Estrogenic substance depresses prolactin secretion during pregnancy; the expulsion of the placenta releases that inhibition and lactation follows.

*Diabetogenic Hormone.*—The ample confirmation of Houssay's observations has led to a considerable volume of work. As is well known, he showed that if a dog is previously deprived of its pituitary, subsequent removal of the pancreas does not cause glycosuria. This has been regarded as the most important addition to our knowledge of diabetes since the discovery of insulin. J. B. Collip<sup>15</sup> maintains, however, that the animal is not entirely free from symptoms of pancreatic diabetes. Its blood-sugar fluctuates within wide limits as the result of feeding, and slight glycosuria (which may fairly be termed alimentary) may follow. Anterior pituitary extract at once raises blood-sugar, and excites glycosuria with ketonuria in such animals. They are also very sensitive to insulin. Even slight fasting may produce severe hypoglycemic collapse, which is dramatically relieved by injection of dextrose. It is not surprising, therefore, that insulin may be fatal to such animals. The diabetogenic

principle in the anterior pituitary is not the thyrotropic hormone since its effect can be obtained in thyroidectomized "Houssay animals".

Houssay has recently obtained this blood-sugar-raising principle from the urine. Lucke found a low blood-sugar in a hypopituitary dwarf which he could raise by Houssay's extract. Hertz found masked symptoms of Gierke's disease in a pituitary dwarf, suggesting a possible inter-relationship between the pituitary and glycogen storage, which fits in with Houssay's conclusion that only the liver is absolutely essential for the action of his diabetogenic hormone. R. M. Wilder and D. L. Wilbur<sup>16</sup> attribute the raising of the blood-sugar level to the action on the liver of adrenalin which is released under the influence of the anterior pituitary. It has a considerable latent period unless introduced direct into the cerebrospinal fluid according to Lucke, who regards this as evidence that it acts through the nervous centres. Funk and a number of other observers, noting the marked ketonuria occurring under such conditions, including von Gierke's disease, claim to have isolated a separate *ketogenic principle*. That it is not identical with the one which raises blood-sugar is suggested by the way it increases the lipid content of the blood, which the latter does not do.

**Antihormones.**—This is perhaps the best place to refer to Collip's views on antihormones. He had previously shown that his parathormone gradually lost its effect on repeated injection. One may imagine that since it acts destructively on the calcium content of bone and muscle this would adequately explain the failure. But he now<sup>17</sup> thinks that the same applies to the pituitary growth hormone, and advances the hypothesis that the production of antihormones may be responsible for hypoglandular states. It is an interesting suggestion, though the purposive character of such antihormones is hard to seek. Certainly thyroid administration is effective when continued over many years. In a later paper<sup>18</sup> he advances the following theories: (1) The responsiveness of an individual to administered hormones varies inversely with the hormone content or production of the subject's own gland. (2) For each hormone there is an antihormone substance. (3) The hormone-antihormone complex may be regarded as a buffer system, small departures from the normal balance of which may be detected by an abnormal response to the administration of a hormone. In conjunction with E. M. Anderson he has studied an unstable antithyrotropic substance obtained from the pituitary, and states that although it lowers the basal metabolic rate, it does not antagonize thyroxin, indicating that the action is on the pituitary thyrotropic hormone, as is further suggested by the fact that the rate is lowered just to the same extent in the hypophysectomized animal.

Scowen and Spence<sup>13</sup> confirmed Collip and Anderson's finding of an antithyrotropic hormone. They do not regard it as an ordinary antibody, the production of which would render hormones quite useless. There is more probably a balance between thyrotropic and antithyrotropic principles. If large doses of one are given, the other is elaborated in an attempt to bring about hormonal equilibrium.

**The Laurence-Moon-Biedl Familial Syndrome.**—This syndrome, of obesity, mental retardation, polydactyly, and retinal pigmentation, illustrates the complexity of the changes in which the pituitary presumably shares. It must remain, however, a presumption, since the condition runs such a slow, almost non-progressive course that no post-mortem record is as yet available, although the syndrome has been well recognized for more than twelve years. E. A. Cockayne, D. Krestin, and A. Sorsby<sup>19</sup> report two families, one of 10 members of whom 3 and possibly 4 were affected, and another of 4 members 3 of whom were affected. There was no consanguinity of parents in either group.

COMMENTS.—Two interesting trends of thought are making themselves increasingly heard. The first is a revolt against attributing each of the multiple functions of the anterior pituitary to a special hormone. It recalls the earlier reaction against the multiplication of 'centres' in the medulla, which led to a much more elastic conception of medullary reflexes. Woollard (*MEDICAL ANNUAL*, 1935, p. 129) was one of the first to voice this revolt, urging that the two distinct types of granular cells were probably accelerators and inhibitors respectively, which determined the general direction in which the pituitary influenced the other ductless glands. It was next reinforced by E. C. Dodds (*MEDICAL ANNUAL*, 1935, p. 128) from a different angle when he pointed out the much greater chemical complexity of anterior pituitary hormones compared with the others, and regarded the former as stimulators of the latter. It is seen in the observations of Collip and of H. M. Evans quoted above. It has been well expressed by P. E. Smith<sup>14</sup> thus: "That this small gland, which in man averages less than 0.5 gm. in weight, secretes this number of hormones as separate entities throughout the entire secretory process taxes the imagination. The differentiation into two highly specialized secretory types of cells suggests perhaps the formation of a corresponding number of basic secretory products which may be altered to give these specific responses. There can be no certainty until physiologically pure extracts are secured as to how much these impurities may modify the responses." One might add to this the fact that somewhat violent chemical measures have been adopted to isolate these pituitary hormones even in only an approximately pure state. It seems more probable that such measures have produced alterations in the basic products as suggested by P. E. Smith. The contrast between the small amount of oestrogenic substance produced by the pituitary and the enormous amount of oestrin formed, for instance, in the placenta which overflows freely into the urine during pregnancy, is highly suggestive of a catalytic agent acting on a large mass of substrate, or at any rate of a stimulating synergic mechanism. It is true that, as stated above, Wright has reported an excess of the pituitary sex hormone in the urine of patients with basophilism, but clinical evidence of increased sexual activity in such patients is, to say the least, more than dubious. The only way to reconcile the presence of an adenoma composed of basophilic sex-hormone producing cells with the loss of sexual function commonly observed, is to lay emphasis on the observation of Crooke and others that these cells in the adenoma are in an altered state. Even so one would have expected a preliminary stage of increased activity which does not in fact occur. That the anterior pituitary produces a sex hormone is undoubted, but that it has its origin in the basophil cells is becoming increasingly doubtful. The way in which a growth in the thymus, a gland usually regarded as antagonistic to sexual development, may simulate the basophilic syndrome adds to those doubts. The close similarity between the syndromes produced by growths of the adrenal cortex and certain pituitary growths, which was recognized as long ago as 1921 by Achard and Thiers, points in the same direction. This aspect has been emphasized by F. G. Lescher and A. H. T. Robb-Smith,<sup>20</sup> who described the case of a woman aged 35 who had a carcinoma of the adrenal cortex producing all the cardinal, and most of the occasional, signs and symptoms of Cushing's syndrome, but with hardly any increase in the pituitary basophil cells. They conclude that the evidence is against these cells producing the gonadotropic hormone, and in favour of their being the source of some depressive inhibitory substance which can produce such conditions as a low metabolic rate, altered carbohydrate metabolism, obesity, lethargy, and lack of sex functions. [Incidentally, however, the basal metabolic rate was raised in two cases under the reviewer's care.] Their patient

died with hyperpyrexia twelve hours after the operation, and this was the fatal termination in one of the reviewer's cases.

The second line of thought is the increasing importance which is being attached to the responsive capacity of the receptor tissues on which these hormones act. As Keith pointed out some years ago, the partial gigantisms in certain cases of hyperpituitarism, in which all the tissues in a particular area were involved, can only be explained on the theory that these locally hypertrophied tissues had developed a special sensitiveness to the growth hormone. A variation in different species in their sensitivity to injected extracts seems to be established. Evans and his associates have shown that whereas the dachshund gives a marked response to growth hormone, the sheep dog does not. As P. E. Smith says, it is evident that the response elicited by injections of any hormone is dependent on at least two factors, the stimulating capacity of the hormone and the responsive capacity of the receptor tissues. The importance of this latter factor is shown by the transplantation of limbs and other structures between embryos of species of different sizes. The transplant responds according to its inherited growth capacity rather than to its new endocrine environment (Harrison<sup>21</sup>). Again, after the menopause oestrin may be present in large amounts, yet reproductive cycles cease, as if the reproductive organs had lost their capacity to respond rather than that the hormonal stimulus had failed. At present, however, we have no inkling as to the mechanism by which this cellular reaction is produced, unless perhaps the synergic action between the pituitary oestrogenic hormone and the placenta provides us with a clue.

**Posterior Lobe.**—Here the problems are simpler, but perhaps on that very account do not appear to have stimulated so much research. E. M. Geiling<sup>22</sup> maintains that the pressor and oxytocic secretions of the posterior pituitary are due to this portion of the gland itself, and not, as has been alleged, to the pars intermedia, which appears to be concerned with melanophore function. One important new observation on the effects of posterior lobe extracts has, however, been made, for E. C. Dodds and others<sup>23</sup> have induced an acute hemorrhagic lesion of the acid-bearing area of the stomach in animals by subcutaneous injection of pituitrin, and chronic ulcers by repeated oral administration. This is accompanied by a reduction of gastric acidity, and a severe anaemia with definite macrocytosis. These experiments recall the fact that acute gastric lesions may follow operations on the base of the brain, while chronic ones may be associated with megalocytic anaemias.

REFERENCES.—<sup>1</sup>*Policlinico* (Sez. Med.), 1934, xli, Dec., 748; <sup>2</sup>*Jour. Amer. Med. Assoc.* 1935, civ, March 23, 998; <sup>3</sup>*Ibid.* Feb. 16, 556; <sup>4</sup>*Ibid.* Feb. 9, 464; <sup>5</sup>*Jour. Pediat.* 1934, June, 774; <sup>6</sup>*Jour. Amer. Med. Assoc.* 1934, ciii, Aug. 4, 314; <sup>7</sup>*Med. Record*, 1935, Feb. 20, 191; <sup>8</sup>*Brit. Jour. Surg.* 1935, xxii, 539; <sup>9</sup>*Lancet*, 1934, ii, Aug. 4, 240; <sup>10</sup>*Amer. Jour. Med. Sci.* 1935, July, exx, 1; <sup>11</sup>*Arch. of Internal Med.* 1935, lv, May, 745; <sup>12</sup>*Jour. Amer. Med. Assoc.* 1935, civ, March 16, 916; <sup>13</sup>*Brit. Med. Jour.* 1934, ii, Nov. 3, 805; <sup>14</sup>*Jour. Amer. Med. Assoc.* 1935, civ, Feb. 16, 548; <sup>15</sup>*Ibid.* March 9, 827; <sup>16</sup>*Arch. of Internal Med.* 1935, lv, Feb., 307; <sup>17</sup>*Jour. Mt. Sinai Hosp.* 1934, May-June, 28, <sup>18</sup>*Jour. Amer. Med. Assoc.* 1935, civ, March 23, 965; <sup>19</sup>*Quart. Jour. Med.* 1935, April, 93; <sup>20</sup>*Ibid.* Jan., 23; <sup>21</sup>Harvey Lectures, 1934; <sup>22</sup>*Jour. Amer. Med. Assoc.* 1935, civ, March 2, 738; <sup>23</sup>*Lancet*, 1935, i, May 11, 1099.

## PITUITARY DISORDERS IN CHILDHOOD.

Reginald Miller, M.D., F.R.C.P.

Pituitary disorders in childhood give rise to disturbances of growth, sex development, and metabolism from abnormal function of the different cell groups in the gland. It is not as yet possible accurately to correlate all the functions of the gland with its various histological structures, but it is almost certain that the eosinophil cells of the anterior lobe produce the growth

hormone, and the basophil cells are suspected of producing the gonadotropic hormone which stimulates the sex glands that are themselves responsible for the development of the sex organs and secondary sexual characters. In addition it probably also produces secretions which react on the thyroid, the adrenals, and the pancreas. Thus the pituitary may be thought to act partly directly and partly indirectly by its influence on other glands.

H. Gardiner-Hill,<sup>1</sup> reviewing the subject of pituitary disorders in childhood, states that although hypopituitary and hyperpituitary states have both been described in the literature, the former rests upon much more assured proofs than the latter.

**Hyperpituitarism.**—This is probably responsible for the common overgrown and overfat child, as experimentally treatment by anterior pituitary produces overgrowth and obesity. Clinically such children practically never show signs of any organic lesion of the pituitary, and in the large majority of cases right themselves after puberty, which is not abnormally delayed. It was pointed out in last year's MEDICAL ANNUAL (p. 298) that it was a common error to take far too serious a view of such cases, and Gardiner-Hill repeats the warning there given against the tendency to label such children as examples of Fröhlich's syndrome on totally insufficient grounds.

**Hypopituitarism** (Plate LVIII, A and B).—Two main types of hypopituitarism are described as occurring in childhood, and in both the underlying pathological lesion has now been well established. The first is *Simmonds's disease*, in which there is destruction of the anterior lobe due to an ischaemic necrosis, the end-result of infarction, septic or otherwise. Secondly, there is *Fröhlich's syndrome*, a deficiency syndrome due to compression of the gland by a parahypophysial tumour. In both, destruction of the anterior lobe results in dwarfism and infantilism. Disturbances of metabolism are present, too. In typical Simmonds's disease, cachexia is the striking feature, whilst in typical Fröhlich's syndrome varying degrees of obesity are found. The outstanding difference between the two syndromes clinically lies in these contrasting metabolic features and in the presence of tumour symptoms in Fröhlich's syndrome. On clinical as opposed to pathological grounds, the nomenclature appears to be too rigid, for cachexia is found not infrequently with para-hypophysial tumours, and typical cases of Fröhlich's syndrome may occur without any tumour. The difficulty in grouping clinical cases satisfactorily with this nomenclature lies obviously in the varying metabolic disturbances. The relationship between the pituitary and these metabolic changes is not at all understood. It would seem better, therefore, at the present stage to use the term 'hypopituitarism' in clinical work for all types showing the characteristic growth and sex defects, and to classify them further according to whether the pathological lesion is of the nature of a tumour or not.

The criteria for the diagnosis of hypopituitarism are as follows :—

1. *Growth and Skeletal Defects.*—Growth defects are present in all types of hypopituitarism in children in whom the functions of the anterior lobe have been interfered with, but their type depends to some extent on the age at which the pathological process begins. Normally the infantile type of skeleton in which the lower measurements (symphysis to soles) are shorter than the upper (symphysis to vertex) is maintained until the age of 6 or 7 years ; but if hypopituitarism develops before this age is reached, the infantile proportions will be retained. In any case there is a tendency for the long bones to be affected more than the trunk.

2. *Bone Development.*—Retardation of ossification is another sign of hypopituitarism in children. X-ray examination (e.g., of the carpus) will show that the centres of ossification appear late, and the epiphyses remain ununited.

PLATE LVIII  
DYSPIUITARISM IN CHILDREN  
(IT. GARDNER-IIILO)

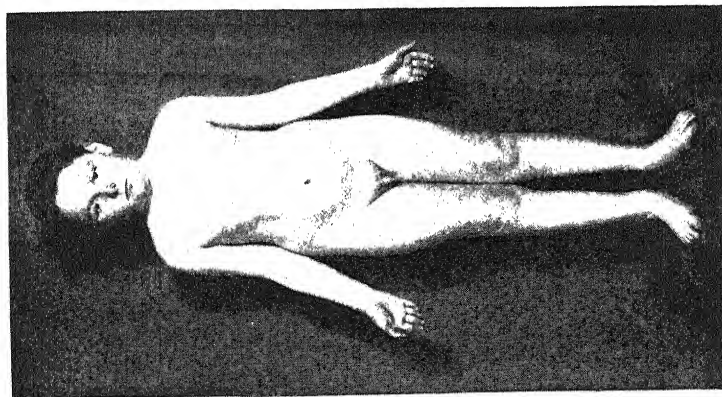


Fig. 4.—Male, aged 14½. Hypopituitary disproportioned dwarfism and sex infantilism; parathyropylsial tumour.

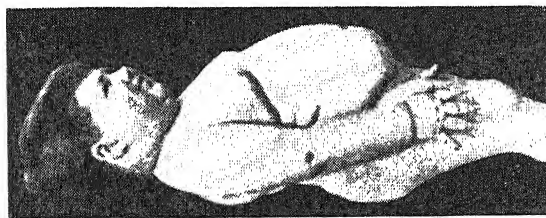


Fig. B.—Male, aged 8. Hypopituitarism following whooping-cough, with characteristic growth and sex defects and obesity.

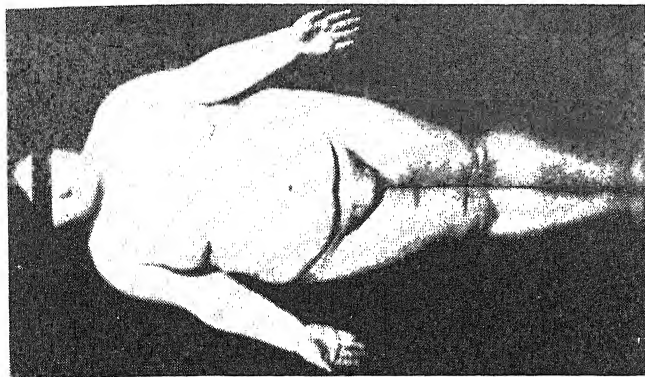


Fig. C.—Female, aged 11. Pituitary basophilism with bursutism and, in addition, growth defect. (Height only 4 ft. 2½ in.)

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3. *Neighbourhood Symptoms*.—Hypopituitarism due to compression from para-hypophysial tumours tends to be accompanied by headache, papilloedema, visual disturbances from damage to the optic tracts, and occasionally pyramidal lesions from pressure on the cerebral peduncles. Skiagrams of the skull may show unfolding and erosion of the pituitary fossa, and a 'beaten silver' appearance of the calvarium due to pressure and thinning of the bone.

4. *Mentality*.—Until the stage of cerebral compression arises in tumour cases, the mentality of children with hypopituitarism remains bright and alert, differing in a marked degree from the untreated case of hypothyroidism.

**Pituitary Basophilia** (*Plate LVIII, C*).—No article dealing with pituitary disorders in childhood would be complete without some brief reference to the condition known as pituitary basophilia, a polyglandular syndrome, the origin of which Cushing attributes to an adenoma of the basophil cells of the anterior lobe. Hitherto it has been considered of cortico-adrenal origin, and there is no doubt that cases have been described of cortical adrenal tumour which have shown all the cardinal and most of the occasional symptoms and signs of Cushing's disease. Moreover, in the majority of the typical cases of Cushing's syndrome reported up to date, adrenal changes, notably cortical hyperplasia, have been present in addition to the pituitary basophilia. It seems probable, therefore, that some of the signs and symptoms of the condition are of adrenal origin.

There is experimental evidence to suggest that the basophil cells of the anterior pituitary secrete the sex-maturing hormone, and as one of the striking features of pituitary basophilia in childhood is a premature development of the secondary sex characters, it is not unnatural to assume that the basophil cells are primarily concerned. It is, however, admittedly difficult to understand why, if this syndrome is due to an over-secretion of the gonad-stimulating hormone, there is almost invariably found atrophy of the testes and ovaries in adults.

In addition to the sex dystrophy, other important symptoms of Cushing's disease are a peculiar and rapidly developing obesity limited to the face, neck, and trunk (the limbs being spared); hypertrichosis of the trunk, face, and limbs; changes in the skin, which becomes very dry, takes on a dusky plethoric hue, and presents numerous purplish lineæ atrophicæ—altogether a characteristic picture which can scarcely fail to be recognized. Vascular hypertension, ecchymoses, pigmentation, and, in some instances, glycosuria and hyperglycæmia are further features of the fully developed syndrome. Neighbourhood symptoms, sellar changes, and visual disturbances are not found.

REFERENCE.—<sup>1</sup>*Practitioner*, 1935, cxxxiv, 480.

## PITUITARY TUMOURS. (See INTRACRANIAL TUMOURS.)

### PLEURODYNIA, EPIDEMIC.

J. D. Rolleston, M.D., F.R.C.P.

**EPIDEMIOLOGY**.—Sporadic cases of this disease, otherwise known as epidemic myalgia, Bornholm disease, devil's grip, etc. (see MEDICAL ANNUAL, 1935, p. 318), are reported by R. Huss<sup>1</sup> to have occurred in 1927, 1929, and 1930 in Sweden, where it became epidemic in 1931, the incidence being as high as 2.6 per cent of the population in some localities. In 1932 and 1933 the disease became sporadic again. As a rule the highest incidence was between the ages of 15 and 30, and both sexes were equally affected.

REFERENCE.—<sup>1</sup>*Bull. Off. internat. d'Hyg. publ.* 1934, xxvi, 1083.

**PNEUMONIA.***J. F. Gaskell, M.A., M.D., F.R.C.P.*

**CLINICAL.**—D. T. Davies, G. Hodgson, and L. E. H. Whitby<sup>1</sup> have made a detailed study of a series of 184 cases of pneumococcal pneumonia at the Hammersmith Hospital, during the year from February, 1932, to April, 1933. Their chief investigations have been with regard to the presence of agglutinins in the disease, the value of serum treatment, and the development of the lung consolidation as shown by X-rays. They first review the mortality over the period 1897 to the present day. An investigation for the period 1897–1906 in London hospitals gave a mortality of 23 per cent; Glasgow from 1920–9 gave 21·5 per cent; St. Bartholomew's Hospital 1925–9 gave 16·6 per cent; Birmingham in recent years gave 25·6 per cent; and a series of their own at the Middlesex and Royal Free Hospitals from 1922–31 gave 19 per cent. It appears, therefore, that there has been very little change in the mortality rate over this period in Great Britain. This rate has been throughout distinctly lower than the American rate of 30 to 33 per cent. Their series also show that mortality increases with age, as is universally found by all observers. Comparing it with the 1897–1905 series, there is a definite reduction in the death-rate between the ages of 20 and 50. The mortality of the other age periods is unchanged.

The authors had 55 cases of Type I infection in the Hammersmith group, 42 of which were in the 10 to 40 age group, agreeing with the more extensive American statistics that this type especially attacks adults in their prime; 19 serious cases had serum therapy, the 36 others had no serum. In these 36 agglutinins were tested for throughout the illness by adding three drops of the patient's serum to one drop of thick coccus emulsion. They usually appeared two to three days after the crisis, not before this; and lasted for about fourteen days only. They are therefore associated with the process of resolution and are no index of true immunity. If complications are present they may persist, or disappear and reappear when the complication is over. The leucocyte count was also watched, and fell, as the agglutinins appeared, from an average of 22,000 to 10,000.

Sixteen of the 19 cases treated with serum were treated in the first four days of illness with great amelioration of symptoms. In those treated from the second day a uniform fall of temperature, pulse, and respiratory rate occurred on the fourth or fifth day, accompanied by a corresponding early fall in the leucocyte count. The clinical amelioration is therefore accompanied by a diminution of the stimulus to the production of leucocytes in the bone-marrow which the disease normally brings about. The serum used was a mixed Type I and II Felton serum containing agglutinins to these types; such agglutinins were easily demonstrable when sufficient serum was given. The appearance of such agglutinins cannot be held to indicate that no more serum is needed, as Sabin, Parsons, Sutcliffe, and others have claimed.

In six cases of the series there was definite serum sickness, but this was never alarming. The source of the serum used was not stated, and last year's report of the investigation under the auspices of the Medical Research Council showed that sera varied considerably in this respect, so that the author's serum probably was an unfortunate one.

They only had 13 cases of Type II, with 5 deaths, and agree that Type II is clinically more toxic, with a lower temperature and fewer physical signs. Agglutinins appeared with recovery as in Type I cases. Leucocyte counts ruled lower, lying between 15,000 and 18,000. These cases were not treated with serum.

Twenty cases were of Type III, of whom 15 were over 40: 7 of these older cases died, but only 1 of the 5 in the younger group; the majority of the older cases had chronic chest trouble. Leucocytosis was lower, averaging 10,000 to

15,000, and agglutinins appeared as resolution phenomena as in the cases of Type I and Type II.

Forty-nine cases came into Group IV; they had a mortality of 14 per cent.

The agglutinin reactions proved of value in confirming the type of the infecting pneumococcus, and in most cases the agglutinin corresponding to the type found in the sputum duly appeared. They were also valuable in detecting the presence of mixed infections in a few cases. These reactions are a simple and useful adjunct to the typing from sputum or lung puncture material.

The radiological examination of patients was done with a special apparatus erected in the ward, and 119 patients in all were investigated: 9 were examined within forty-eight hours of onset and 16 within seventy-two hours. The results agree with those of Sante (1923), Graeser, Robertson, and Wu, reviewed last year, and also with the experimental investigation in dogs by Terrell, Robertson, and Coggeshall.

Marked changes can be seen in twenty-four hours. Opacity starts from the hilum and spreads outwards, reaching the surface on the third day. Vascular engorgement is seen in this period as very definite thickening of the stric on the radiogram. Coincidentally the diaphragm rises on the affected side, whatever lobe or lobes are affected, and the intercostal spaces become narrowed. Deflection of the heart and mediastinum was only seen in a few cases where development of consolidation was very rapid. An entirely different picture was seen occasionally in Type III and Group IV cases. The opacity started at the periphery. In such cases physical signs may then not be definite till the hilum is reached. The density becomes maximum on the fourth to seventh day. Definite physical signs always become evident much later than the X-ray shadows.

Thirty-seven of the Type I cases were followed closely throughout the illness. In a number of these more than one lobe was radiologically affected, though clinically in all but two there was no sign of this. Only one case showed radiologically a definite late extension. With resolution the hilar glands enlarge; the resolution process may take anything from ten to fifty days, the periphery clearing first. No alteration in the development of consolidation or the time of resolution was apparent in the cases treated with serum. This is additional evidence that serum acts on the general toxæmia of the condition and does not influence the local process in the lung. The other groups conformed to the Type I group radiologically except for the patchy peripheral Type III and Group IV cases.

X-rays were found to be of little help in determining the presence of early empyema. Pus was found in cases where X-rays gave no definite evidence. This is reasonable as the solid lung is already giving a shadow. The heart showed increase in size in only 3 cases, in each of which blood-pressure fell to a low level and a relative bradycardia was present.

In a review of the clinical aspects of pneumonia on the Rand, F. Daubenton<sup>2</sup> finds that the diagnosis between bronchopneumonia, influenzal pneumonia, and bronchitis varies greatly in different hospitals at the same period, showing that the differentiation is difficult and varies with the clinician. He accepts the view that pneumonia is not common among the natives when at home, and its incidence varies with the rate of importation of natives into the mine compounds. A common form has no typical onset but gradually increasing signs up to a final lobar consolidation, being more of the influenzal type than the true lobar pneumonia. Another difficulty in diagnosis is the typho-pneumonia type with strong Widal reactions. No typhoid bacilli have ever been found in the sputum, and he concludes that this type is pneumonia complicating an early typhoid infection. W. H. Palmer<sup>2</sup> agrees that the lobar type is

seldom seen. Frew,<sup>2</sup> as the result of thirty years' experience on the Reef, has seen no great progress in treatment during this period. The physique of the native is most important, and the early days are the most dangerous, but an influx of new miners also increased the incidence in old miners. The addition of partitions in the sleeping huts appears to have decreased the incidence of pneumonia. Vaccine protective therapy was of great value, and gave the best protection when given in a single large dose.

D. J. Stephens<sup>3</sup> has studied the appearance of *myelocytes in the peripheral blood* in pneumonia. His series consisted of 43 cases, 13 of which died. He made daily counts extending far into the convalescent period. Myelocytes appear in the early febrile period after the third or fourth day and constitute 1 to 2 per cent of the white cells. There was no difference whether the patient died or recovered. The greatest myelocyte response, however, occurred after the acute stage was over, usually one to five days after defervescence. The proportional count rose to 5 per cent in two-thirds of the recoveries, to 10 per cent in one-third, and up to 15 per cent in three cases. The average of the 30 cases was 7.5 per cent. The presence of myelocytes was of brief duration and usually disappeared in another week. He concludes that this post-febrile myelocytosis is very common in pneumonia though not in other febrile diseases. Possibly it is due to the stimulant effect of the liberation of large masses of nuclear material during resolution.

T. F. McNair Scott and M. Finland<sup>4</sup> have used a new method of vital staining by neutral red and Janus green to study the *cells in the pleural effusions* in pneumonia. The former stains granules and vacuoles and the latter mitochondria. The fact that there is always some exudate in the pleural cavity in pneumonia has long been recognized. Their material consisted of 53 fluids, 32 sterile and 21 infected. Neutrophil polymorphs form 80 per cent of cells in the uninfected and 100 per cent in infected fluids. When resting or dying they are rounded, but are irregular in shape and motile when active. In uninfected cases polymorphs fall rapidly to 60 per cent on the eighth day, in infected cases they rise rapidly to 100 per cent. Eosinophils vary and may rise to 12 per cent. In one very prolonged sterile effusion they rose to 70 per cent; there were only 10 per cent in the blood at this time. Macrophages appear late in sterile fluids and lymphocytes later still. The latter are not obviously protective, as over one-third of fluids with over 10 per cent lymphocytes became infected. Monocytes are like those of the blood, and mesothelial cells, which are cast off from the endothelium, show no activity, phagocytic or otherwise.

Harlow Brooks<sup>5</sup> has investigated the *cause of death* in 200 cases of pneumonia, all of which had autopsies. This is a sequel to an exhaustive analysis of 5000 cases in the war epidemic of 1917-19. He then concluded that death was usually from terminal cardiac failure with dilatation of the right side. His 200 cases all had type specific pneumococci in the sputum or blood; 77 cases died with clinical cardiac failure; 116 cases had chronic cardiac disease which must have preceded the pneumonia. In 73 cases acute cardiac lesions developed, in 14 acute endocarditis. Cases of cardiac disease are 'bad risks' in pneumonia. Brooks, however, holds that a second circulatory factor is important—namely, dilatation and congestion of capillaries and veins—and attributes this to vasomotor paralysis rather than to a toxic cause, as Bruce Perry and others do: 109 cases showed this. 'Sepsis', including septicæmia, acute endocarditis, meningitis, empyema, and lung abscess, was present in 90 cases. The rôle of anoxæmia is difficult to assess. The extent of lung involvement is a very minor matter and has little influence on mortality. Pulmonary embolism is negligible, but atelectasis and massive collapse is not uncommon with empyema, and this

collapse may in a few cases have been the immediate cause of death. Old tuberculosis was found in only 18 cases, in only 2 of which reactivation had given rise to a general tuberculosis and thence to death. Only 5 cases had an alcoholic history.

A. Weinstein and M. Goodman<sup>6</sup> have investigated the question of the *influence of syphilis in causing delayed resolution*, an influence which has been emphasized by other authors. From a series of 900 cases they selected 509, in all of which the Wassermann reaction was known: 27.3 per cent had syphilis—50 per cent of a group of coloured patients and 6.9 per cent of a group of white patients. Forty-five patients had abnormal physical signs and abnormal shadows in the chest in the radiogram for more than fourteen days after the termination of the acute phase of their illness: 15 of these had syphilis, 30 had not. Empyema occurred in 23 of the non-syphilitic and in 5 of the syphilitics, giving respective percentages of 6.2 and 3.6. The death-rate in non-complicated syphilis was 22.3 per cent and in the non-syphilitic was 20 per cent. These figures disprove any direct association between syphilis and delayed resolution or empyema. The authors also studied the occurrence of chronic pulmonary infection in a series of 4000 autopsies. They found only 30 cases of this with no obvious connection with some other cause. Only 5 of these (16 per cent) were syphilitic, a normal proportion in the hospital class investigated. Syphilis has therefore no proved relationship to the occurrence of delayed resolution or other chronic lung condition.

In a study of *pneumococcus Type VIII* in Cooper's classification J. G. M. Bullowa<sup>7</sup> has collected 122 cases in a series of 2067 pneumonias in adults and 11 cases in a series of 500 children. Type VIII is very nearly related to Type III and can easily be confused in agglutination tests. It is on the whole a milder affection with a rather insidious onset and a tendency to terminate by lysis rather than crisis. Physical signs may be classical, but are usually rather indefinite, and X-rays show as a rule less complete involvement of the lung than in Type III. Rusty sputum was present in 40 per cent, but is not of such grave significance as in other types. Empyema occurred in only 2.4 per cent. Bacteræmia is higher than with Type III but of less significance, the mortality of cases with bacteræmia being only 42 per cent as against 100 per cent in Type III. Most cases terminated in eight days. The total mortality was 16 per cent, comparing favourably with 30 per cent in Type III cases. The type appears to give rise to one unfavourable condition—namely, a late invasion of the blood-stream and meninges after an apparent subsidence of the infection.

J. G. M. Bullowa and C. Wilcox<sup>8</sup> have analysed 1725 cases of pneumonia, each due to a single typed infection and treated in Harlem Hospital during the five years 1928–33, with regard to the *occurrence of bacteræmia in the various types*. They found only 41 per cent came into the Types I, II, and III group; 59 per cent belonged to the Types IV to XXXII of Cooper. The death-rate throughout was very steady, the percentage of bacteræmia and mortality in the groups being approximately equal. Type II was found to have the highest bacteræmia. Of cases with bacteræmia 64 per cent died, but 20 per cent of the non-fatal cases of the three main types also had bacteræmia. Half of the cases with bacteræmia were due to the three main types, and in this group the mortality was only 33 per cent owing to the improvement produced by serum treatment. The other half of the bacteræmia cases were due to the other group and were very fatal, proving the necessity for production of potent sera for Types IV to XXXII.

M. Finland and A. W. Winkler<sup>9</sup> have studied the question of the presence of *immunity after previous attacks*. Their series with multiple attacks consisted

of 57 cases, in all of which the type of infection had been serologically identified. The literature shows that from 13.6 per cent to 31 per cent of cases have a history of earlier attacks. In their series all attacks were separated by a definite period of recovery, the mean interval being four years. In the majority (72 per cent) the attacks were lobar on each occasion, and the location of the lesions was of the usual order of frequency in first, second, and other attacks. The duration of disease and mode of termination were the same in 69 per cent. The distribution of types was also that usually found, and there was no correlation between types in the different attacks; the second attack may be of the same type or a different one, according to the usual type distribution. There is therefore no lasting immunity either to the same or any other type. Specific therapy did not influence this, and immunity reactions were of very variable duration. Specific antibodies could be demonstrated after one year in only one case.

Findlay J. Ford<sup>10</sup> has also dealt with this question of multiple attacks in an investigation of the after-results of pneumonia in children during the three-year period 1931-4. Of 370 cases treated in his wards, 170 died, leaving 200, out of whom 184 were watched over lengthy periods. Bronchopneumonia and the lobar type were both included.

Dividing cases into three age groups, 0-2, 2-5, 5-12, 12 out of the 19 recurrences occurred in those under 2. However, Ford treats as recurrences cases with second attacks within a month, so that some of his cases are probably examples of chronic recurrent pneumonia in infants and are not true re-infections. Of the 184 cases, 27 per cent had more than one attack of pneumonia either before or after their first attack in hospital. Of these, 85 per cent had trouble in the upper respiratory tract or rickets. He observed no instance of the later development of tuberculosis and there was only one doubtful case of bronchiectasis. The chief sequela was a flattening of the chest over the affected area, easily treatable with appropriate breathing exercises, etc.

**TREATMENT.**—The efficacy of *serum treatment* is being demonstrated ever more widely. Little serum treatment has been given hitherto in Germany. H. Becker<sup>11</sup> publishes a report of 180 cases occurring in Leipzig during the two years from October, 1932, to February, 1934, 70 per cent of which were treated with serum and 30 per cent acted as controls. The serum used was produced by I. G. Farben and was of the Felton type for Types I and II. A polyvalent serum was also used, especially in the earlier part of the investigation. The author also gave a quinine preparation by daily intramuscular injection to all patients. The disease had a severe form in the season 1933-4. The percentage of each Type was very similar to that found by Gundel in Heidelberg and other observers outside Germany: 40 per cent were Type I, 32 per cent Type II, 16 per cent Type III, and 12 per cent Group IV. His mortality figures were 15 per cent for Type I, 30 per cent for Type II, 55 per cent for Type III. The age distribution figures also conform to the figures of others. He used the rapid typing method of Neufeld, later elaborated by Sabin and others. Serum was always used for the most severe cases, and the clinical improvement even in the worst cases was always very definite. The serum was given intramuscularly for the most part; only in a few cases was it given intravenously. In contradiction to the view that intramuscular injections take a long time to be absorbed, he found that clinical improvement followed such injection very rapidly; he seldom had to give more than 100 c.c. The mortality fell in Type I cases from 20 to 8.2 per cent, and in Type II cases from 30 to 15 per cent, notwithstanding the selection of the most severe cases for serum treatment. He got constantly the partial fall of temperature, etc., noted by others. In Type III there was no improvement. In this group consolidation was

conspicuously massive—cases were very toxic with a low leucocyte response. This type occurred predominantly in younger people, and the mortality in those under 30 was between 35 and 40 per cent. In Group IV polyvalent serum was given in a few cases only and it appeared to have no effect. The mortality in this group was low. In cases of pneumococcal sepsis, serum was useless. Bacteremia was very common, but blood infection with over twenty colonies in a culture from 1 c.c. of blood was almost always fatal. This Becker takes as the criterion of massive blood infection. He had no serum sickness of any serious degree. There was no evidence that serum treatment increased complications or delayed resolution. He concludes that early admission to hospital with early typing and specific treatment is essential to the proper treatment of pneumonia.

R. M. Murray Lyon<sup>12</sup> describes an investigation at the Royal Infirmary, Edinburgh. The distribution of types was usual except that Type II with 49 per cent was unusually high. The crude mortality was 25 per cent, with again the usual type distribution. Of 700 cases, 561 were admitted before the fifth day, with a mortality of 21.7 per cent, and the other 139 had a mortality of 38.8 per cent. This was partly due to the sending into hospital of patients taking an unfavourable turn at the last minute. Serum was given before the fifth day to 80 patients between the ages of 20 and 60 with Types I and II infections: 24 were Type I and 56 Type II. The mortality fell in Type I from 20 to 8.3 per cent, and in Type II from 33.7 to 26.8 per cent. There was a tendency throughout to give serum to the worst cases.

The serum was given intravenously, 10,000 to 20,000 Felton units being given four-hourly till the temperature fell. The average total dose was 50,000 units for Type I and 60,000 units for Type II. Serum sickness occurred in 13 out of 110 cases, but only with the serum used in the early days. Shock symptoms were relieved by adrenalin.

R. L. Hamilton<sup>13</sup> also reports a series of 178 cases in Sayre, Pennsylvania, 32 of which were treated with serum. The mortality rate was reduced from 34.8 to 9.4 per cent and the incidence of complications from 50 to 31 per cent. Felton serum was given intravenously every eight hours in 10-c.c. doses till the temperature and pulse-rate dropped.

H. L. Heimann and F. V. Stephen-Lewis<sup>14</sup> review the effects of treatment in the Johannesburg native hospital from 1924–33. The cases are grouped into lobar and bronchopneumonia. Three main forms of treatment were tried: (1) Lister vaccine; (2) Transpulmin; and (3) A polyvalent pneumococcal serum from the South Africa Institute of Medical Research, which was made up according to the types of pneumococcal infection prevailing from time to time. No improvement was manifest with (1) and (2), but (3) gave definitely better figures. In the bronchopneumonia group the mortality fell from 25 to 6 per cent and in the lobar group from 18.5 to 11 per cent. Early administration of serum definitely diminished the duration of illness.

A. E. Cohn and W. H. Lewis<sup>15</sup> have made a detailed investigation into the value of *digitalis* in the treatment of pneumonia. They endeavour to evaluate the severity of the disease by a number of arbitrary factors which they label complications, and give curves showing that the mortality rises according to the number of such factors present. They find that the administration of *digitalis* has little influence on mortality except when cardiac complications are present. The balance of evidence is that *digitalis* does no harm and may be slightly beneficial. They criticize the work of Woodruffe, Wyekoff, and others in that they did not attempt to weigh the severity of the disease, and also that their figures are indeterminate and their condemnation of *digitalis* is based on a very small balance of evidence. The evidence for exciting

fibrillation with digitalis is very slight. Fibrillation is not a usual factor in causing death, and when present often stops before the patient is moribund.

L. E. Hines and D. Bennett<sup>16</sup> have used *artificial pneumothorax* in 12 cases, 4 of which died. They hold it is valuable because it relieves symptoms such as pain, etc., but it has little influence on the course of the disease.

Trevor Thomas<sup>17</sup> describes 300 cases, half of which were treated by intramuscular *quinine*. His figures show practically no effect, but he holds that the general effect is beneficial, by shortening the length of illness and causing a more rapid disappearance of signs in the chest.

REFERENCES.—<sup>1</sup>*Lancet*, 1935, i, April 6, 791, April 13, 849, April 20, 919; <sup>2</sup>*S. African Med. Jour.* 1935, ix, April 27, 257; <sup>3</sup>*Amer. Jour. Med. Sci.* 1934, clxxxviii, Sept., 332; <sup>4</sup>*Ibid.* 322; <sup>5</sup>*Jour. Amer. Med. Assoc.* 1934, ciii, Oct. 20, 1192; <sup>6</sup>*Amer. Jour. Med. Sci.* 1934, clxxxviii, Nov. 716; <sup>7</sup>*Ibid.* 1935, cxc, July, 65; <sup>8</sup>*Arch. of Internal Med.* 1935, lv, April, 538; <sup>9</sup>*Amer. Jour. Med. Sci.* 1934, clxxxviii, Sept., 309; <sup>10</sup>*Glasgow Med. Jour.* 1934, cxxii, Aug. 147; <sup>11</sup>*Munch. med. Woch.* 1934, lxxi, Sept. 28, 1487; <sup>12</sup>*Eddin. Med. Jour.* 1935, xlii, April, 59; <sup>13</sup>*Med. Record*, 1934, cxi, Sept. 19, 298; <sup>14</sup>*S. African Med. Jour.* 1935, ix, March 23, 179; <sup>15</sup>*Amer. Jour. Med. Sci.* 1935, clxxxix, April, 457; <sup>16</sup>*Arch. of Internal Med.* 1935, lv, Jan., 100; <sup>17</sup>*Med. Press and Circ.* 1934, clxxxix, Oct. 31, 396.

**POISONING.** (See also CHEMICAL WARFARE AND CIVILIANS; INDUSTRIAL DISEASES; MUSHROOM POISONING; POLYNEURITIS, APIOL; TETRA-ETHYL LEAD ENCEPHALITIS.) G. E. Oates, M.D., M.R.C.P., D.P.H.

**Hydrocyanic Acid Gas Poisoning.**—Hydrocyanic acid boils and is rapidly vaporized at a temperature of 75° F. The vapour can exist in strong concentration below this temperature and is largely used for the disinfection of ships, houses, and furniture. A Memorandum issued by the Ministry of Health on the Fumigation of Ships with Hydrogen Cyanide<sup>1</sup> contains a concise account of the symptoms and treatment of poisoning by the gas. The onset in the acute form is rapid, and even a brief exposure in an atmosphere containing a high concentration of the gas may be fatal. In lower concentrations the symptoms of the initial stages of poisoning are usually irritation or choking in the throat, palpitation, dizziness, and heaviness in the limbs, followed by loss of power and unconsciousness. Redness of the conjunctiva and salivation are frequently present. If any of these symptoms or signs are noticed and the gas-mask has been taken off, it should be replaced immediately and the operator should go as quickly as possible into the open air and only then remove his mask.

Should a person be overcome by the gas, the first consideration is to remove him to the fresh air as quickly as possible. If a rescue is to be attempted, however, experience has unfortunately shown that unless the rescuers are protected with masks or at least are furnished with life-lines, they may themselves be killed.

#### FIRST-AID.—

1. If the patient is unconscious and breathing is shallow or has stopped :—  
a. *Apply artificial respiration at once and continue it steadily.* The importance of artificial respiration cannot be too strongly emphasized in an emergency of this nature, and the further steps which are suggested are only additional to this essential first-aid measure. Artificial respiration should not be stopped whilst the other measures are being applied.

b. *Give oxygen, or, preferably, a mixture of oxygen and carbon dioxide.*

c. Give a hypodermic (or, better still, an intramuscular) injection of *lobeline hydrochloride*  $\frac{1}{10}$  gr. Subcutaneous injections of a 5 per cent solution of *sodium thiosulphate* (in doses up to 100 c.c.) are also recommended.

d. If lobeline is not available give a hypodermic injection either of *atropine*, *caffeine*, or *strychnine*. Camphor is useless.



e. When natural breathing starts continue to give oxygen.

2. If the patient is still conscious when removed into the fresh air, *deep breathing* and, as far as practicable, *vigorous exercise in the open air* should be practised. If the patient is able to swallow, very strong *coffee* should be given. Alcohol must not be taken, but if the symptoms are severe a hypodermic injection of *caffeine sodium benzoate*, 2 gr., may be given.

A. M. M. Grierson,<sup>2</sup> who has had extensive practical experience in the use of hydrocyanic acid gas, regards a burning sensation in the nasopharynx as a premonitory symptom that fresh air must be sought immediately or a gas-mask be worn. He also notes that the conjunctivæ of those exposed to slight dosage for any length of time become pink, without any subjective sensations, and the supervising officer should be on the watch for this sign in his men. This pinkness is not inflammatory. The exact effect on the human respiratory apparatus of small sub-lethal doses of hydrocyanic acid is not known, but, from analogy with animal experiments, it may be supposed that there is, in the early stages of poisoning by inhalation, a slight increase in the respiratory rate, which tends in turn to cause larger amounts of cyanide to be absorbed. This might account for persons being overcome in an atmosphere in which a small amount of the gas is present, without attributing such cases of poisoning to a cumulative effect. The author believes also that the absorption of small amounts of the gas is not as dangerous as formerly believed, and can be neutralized by immediate recourse to deep breathing in fresh air. It is also advisable for operators to avoid undue hurry or physical exertion as much as possible, since the increased respiratory rate which automatically follows may be responsible for slight cases of poisoning.

(See also BED-BUGS AND THEIR CONTROL.)

**Aspirin Poisoning.**—Few cases of poisoning by acetyl-salicylic acid (aspirin) have been reported in this country. W. Wilcox,<sup>3</sup> though including its consideration in a lecture on toxic drugs, has lately placed upon record the opinion that aspirin is "one of the most valuable and safe of simple remedies". The fatal dose of aspirin is stated by various authorities to be from 300 to 600 gr. S. C. Dyke<sup>1</sup> has closely studied a case of aspirin poisoning, the dose being about 435 gr. and the patient recovering. The clinical manifestations pointed to a profound disturbance of metabolism, and to toxæmia with a heavy incidence on the higher nervous centres. In the early stages the extreme hyperpnœa was a marked feature. This is one of the symptoms of salicylic-acid poisoning, and may be due to the direct action of the acid radical of the compound on the respiratory centre. In aspirin poisoning it appears only when acetone is present in the urine, and when a state of so-called acidosis has been established. It is held by some that the hyperpnœa is really due to the action of an acid substance released as a result of the disturbed metabolism. In the author's case evidence of the widespread nature of the toxæmia was afforded by the urine, which showed, in addition to acetone, bile salts, albumin, and granular casts, both liver and kidneys being apparently severely damaged. Pyrexia was present. There were no symptoms referable to the alimentary tract. Lumbar puncture afforded great relief, the cerebrospinal fluid being apparently saturated with the noxa. In a fatal case of aspirin poisoning reported by A. M. Wyllie<sup>5</sup> there was profuse perspiration, and, post mortem, blood was found in the stomach and petechial hæmorrhages on the serous membranes, in addition to the usual signs in the liver and kidneys.

**Carbon Tetrachloride Poisoning.**—S. F. Dudley<sup>6</sup> describes four cases of grave renal disorder caused by poisoning with carbon tetrachloride vapour, a matter of great interest to the general public, since all over the world this substance is used in small portable fire extinguishers which are often employed

in small enclosed spaces. The author is of the firm opinion that the poisoning was due to the vapour and not to the products of combustion or decomposition, since these are so unpleasant that anyone exposed to them will remove himself at once. He is of the opinion that delay in the onset of symptoms may have led to many similar cases of poisoning having been unrecognized or attributed to other causes. The cases cited show that there is a wide variation in susceptibility to the vapour. The author points out that if a man becomes unconscious at a fire where carbon tetrachloride has been used, he should be promptly treated as a potential case of renal, hepatic, and possibly calcium insufficiency. The occurrence of such cases is no valid argument against the use of carbon tetrachloride as a fire extinguisher, but serves as a warning to medical men to be on the look-out for such easily missed cases.

**Marking Ink as a Poison.**—The Medical Officer of Health for Holborn, in his Annual Report for 1934, describes cases of what was apparently poisoning in four persons sleeping in separate rooms in a private hotel. They were taken ill after sleeping for one night in beds on which, in each case, there was one blanket which had been marked with large stencils the day before. The symptoms were headache, sickness, faintness, jaundice, and cyanosis. None of the patients became unconscious, and all recovered within twenty-four hours. The blankets were marked with a permanent stamping ink which, on analysis, was found to contain nitrobenzene, aniline, orthotoluidine, aniline black, with copper and ammonium salts. The blankets had not been washed, nor was the stencilling dry before the blankets were used. The cases were clearly due to slight poisoning with nitrobenzene and other constituents occurring in commercial aniline oil, and may serve as a warning to the practitioner to bear in mind the possibility of poisoning when anomalous symptoms cause a difficulty in diagnosis.

REFERENCES.—<sup>1</sup>H.M. Stationery Office, 1933; <sup>2</sup>*Public Health*, 1935, xlviii, No. 10, July, 347; <sup>3</sup>*Lancet*, 1935, i, 1155; <sup>4</sup>*Ibid.* ii, 613; <sup>5</sup>*Ibid.* 768; <sup>6</sup>*Jour. of Indust. Hyg.* 1935, xvii, No. 3, May, 93.

## **POLIOMYELITIS, ACUTE.**

*E. W. Hey Groves, M.S., F.R.C.S.*  
*K. H. Pridie, F.R.C.S.*

### **THE TREATMENT OF PERMANENT DELTOID PARALYSIS.**

In cases with permanent deltoid paralysis, there is the following choice of surgical treatment: (1) Arthrodesis; (2) Muscle transplantation.

**1. Arthrodesis.**—This procedure gives a rigid stable arm, with limited movement. There are many disadvantages to this method of treatment:—

a. The movement is limited, and many important movements cannot be performed. The range of movement is usually limited to 90 per cent. Many useful movements, such as putting the hand in the pocket or to the back of the head, are impossible. Should the elbow or wrist have to be ankylosed, the limb becomes almost useless.

b. After arthrodesis there is a danger of fracture following an abnormal strain or injury, the bones of a paralysed limb being decalcified, and therefore more liable to fracture.

c. An ankylosed shoulder in a female is contra-indicated for cosmetic reasons, on account of the associated winging of the scapula.

d. Under 12 years of age an arthrodesis is not successful.

e. An arthrodesis of the shoulder may lead to the development of a scoliosis.

The chief indication for arthrodesis in a flail shoulder is when the other muscles of the arm and forearm are not much involved, and the patient is a



*PLATE LIX*

MUSCLE TRANSPLANTATION FOR DELTOID  
PARALYSIS

(S. L. HAAS)



*Fig. A.*—Range of motion of left arm  
before operation.



*Fig. B.*—Result five years after  
trapezius fascia transposition.

*By kind permission of the  
'Journal of the American Medical Association'*

young man who wishes to follow some hard form of labour. In such a case the limb could be used to better advantage with a stable joint.

**2. Muscle Transplantation.**—The muscles available for transplantation about the shoulder are: trapezius, triceps, biceps, pectoralis major, and teres minor, the most useful being the trapezius. S. L. Haas<sup>1</sup> describes the operation as follows:—

An incision is made beginning well out on the spine of the scapula and following along the acromion to the outer third of the clavicle, after which the insertion of the trapezius is freed till it forms a tongue-like process. A sufficiently long and wide strip of fascia lata is then taken and sutured to the raised trapezius muscle by silk thread. The fascia is passed over the acromion process and stitched under the perimysium of the paralysed deltoid, the lower end of the strip being stitched under a spicule of bone raised from the deltoid eminence.

Haas states that there is so often a luxation of the humerus from the glenoid cavity that if this operation is to be a success the long head of the biceps must be used to anchor the head of the humerus, as in the Kiliani-Nicola operation. *Plate LIX* shows a case treated by this method.

*After-treatment.*—Following this operation a long period of protection in an abduction frame is necessary—from six to twelve months.

REFERENCE.—<sup>1</sup>*Jour. Amer. Med. Assoc.* 1935, civ, Jan. 12, 99.

## POLYNEURITIS, APIOL.

Macdonald Critchley, M.D., F.R.C.P.

In a previous volume of the MEDICAL ANNUAL (1932, p. 259) a full account was given of the outbreak of Jamaica ginger (or 'Jake') paralysis in the United States. It was ultimately discovered that the polyneuritis was due, not to the alcohol, but to the presence of triorthoeresyl phosphate in the synthetic preparations of Jamaica ginger. During the last four years we find the same chemical substance giving rise to profound polyneuritic symptoms under another set of conditions. In 1931 cases of peripheral neuritis were recorded in Holland<sup>1</sup> and in Yugoslavia,<sup>2</sup> resulting from the ingestion of apiol for abortifacient purposes. Since then numerous cases have been reported from the continent of Europe. One case has been described in 1935 in the United States, by R. Denison and J. C. Yaskin,<sup>3</sup> whose paper gives an excellent account of previous work. Although no cases from England have appeared in the literature, one such case has come under the reviewer's care. There is no reason why other cases should not also develop, since various proprietary preparations of apiol are on open sale in chemists' shops in this country. Apiol, itself, which is an extract of parsley, is not toxic, but neuritis in these cases is due to the presence of triorthoeresyl phosphate as a preservative.<sup>4, 5</sup>

The clinical course of apiol polyneuritis has been well described by J. W. G. ter Braak and R. Carillo,<sup>6</sup> basing their evidence upon a series of 50 cases. Several days after the abortifacient has been taken, various transient abdominal symptoms appear. There follows a symptomless period, averaging seventeen days. Cramps in the legs now set in with some abruptness, followed the next day or so by weakness and numbness in the lower limbs. After about a week the same symptoms appear in the upper extremities. Muscular weakness increases while the sensory symptoms subside. The final picture is that of wasting and weakness of the muscles of the hands and feet, with little or no objective or subjective disorders of sensation. Although the ankle-jerks are lost the other tendon reflexes may be intact. No improvement occurs until about six months after the onset, but eventual recovery is the rule.

The American case differed somewhat in the severity of the initial gastrointestinal symptoms and in the ultimate paralysis. Only a slight improvement

was evident three months after the original ingestion of the apiol compound (in this case the proprietary medicine 'Savatan' was responsible). Furthermore, an intense generalized rash was present in this case, reminiscent of arsenical poisoning.

In the reviewer's case, the striking clinical features were the greater degree of paralysis in the arms than legs, the marked involvement of proximal as well as distal groups of muscles, and the relative intractability.

REFERENCES.—<sup>1</sup>*Nederl. Tijds. v. Geneesk.* 1931, lxxv, May 2, 2329; <sup>2</sup>*Med. Klinik*, 1931, xxvii, Dec. 11, 1821; <sup>3</sup>*Jour. Amer. Med. Assoc.* 1935, civ, May 18, 1812; <sup>4</sup>*Arch. j. exper. Path. u. Pharmac.* 1932, clxv, 84; <sup>5</sup>*Ibid.* 1933, clxxi, 439; <sup>6</sup>*Deut. Zeits. f. Nervenheilk.* 1932, cxxv, 86.

## POST-OPERATIVE COMPLICATIONS AND TREATMENT.

*Sir W. I. de C. Wheeler, F.R.C.S.I.*

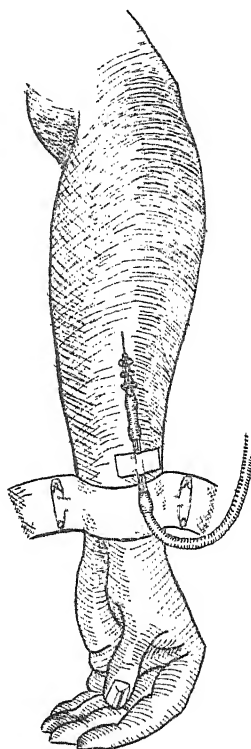
By way of once again emphasizing the necessity for strict personal attention to the post-operative management of a major surgical case, a comparatively simple operation such as removal of the gall-bladder will be mentioned. On the way from the theatre to the wards the patient's head should be covered by a blanket to protect him from the dangers of inspiring cold air in the corridors. The contrast of the heated theatres and the cold passages is great and may be a factor in producing post-operative respiratory complications. In high abdominal operations the descent of the diaphragm is impeded by pain and reflex rigidity and basal oedema of the lung frequently follows.

The Fowler position is adopted when the patient recovers from the anaesthetic. Often a poor attempt is made to maintain this position and the patient is found with an arched back, but the pelvis and abdomen are in reality horizontal. A bolster under the knees tied by a bandage to either side of the head of the bed helps to maintain the upright position in addition to relieving the abdominal tension by flexion of the knees. Two blocks under the end of the bed also assist in keeping the patient upright. A box at the foot of the bed under the clothes against which the feet of the patient rest is an additional support. Fluids and chlorides (it is not sufficiently realized that there is a diminution in chlorides in most abdominal cases) are best administered in uncomplicated cases by the old method of rectal infusions. For the first twenty-four hours  $\frac{1}{2}$  gr. of morphia is given every sixth hour. The infusion of 1 pint of saline may with advantage be given every six hours ten minutes after the injection of morphia. By this time the patient is able as a rule to take sufficient fluids (glucose, orange-juice, water, etc.) by the mouth in small quantities. The morphia may also be discontinued. For pain and discomfort a simple cachet of pyramidon 5 gr. and caffeine cit. 1 gr. given every four to six hours suffices. On the third day the drain is removed, and early the following morning 1 oz. of castor oil is given followed in six hours by an enema if necessary. An aperient in the morning is preferable to one given at night. The latter always is followed by disturbed rest. The patient is told to keep moving about in bed as much as possible and to practice deep inspirations. It is a good plan to allow the patient up early. On the sixth or seventh day he should be allowed up in a chair. There is no extra strain put on the wound and the incidence of pulmonary embolus is lessened by early activities. This is the routine management of an uncomplicated case following operation. If stomach lavage is necessary a small Jutte or Ryall tube is passed through the nose. The patient is not asked to hold a mouth full of water and to swallow at the psychological moment; he is asked to keep on drinking, and usually before he is aware of the fact the nasal tube is in the stomach. Aspiration is then employed and if necessary the tube may be left *in situ*.

**Continuous Intravenous Infusions.**—In anxious cases continuous intravenous infusion has been a great addition to the surgeon's armamentarium. The late J. B. Murphy introduced continuous rectal saline for the restoration of the circulating fluids, for the replenishment of chlorides, for the flushing out of toxins, and for the reversal of the lymphatic flow when the toxins were being absorbed in cases of generalized peritonitis. The results are more striking from the more direct method of continuous intravenous medication. Strong solutions of glucose should not be given by this method as there is a tendency to sclerosis and obliteration of the veins: 5 per cent solutions are safe in this respect.

E. L. Farquharson<sup>1</sup> gives some useful hints as to the methods employed for continuous intravenous infusion. He reminds his readers that serum therapy can be employed more safely by this method than by any other. Little danger of anaphylaxis accompanies the continuous drip of the antiserum into the veins, and very much larger quantities may be given than when a massive dose is employed. The reviewer has found that continuous intravenous glucose is almost a specific in cases of uremia and anuria during the management of prostatic and other genito-urinary cases. It is also a vehicle for the administration of glucose and insulin in diabetic coma. Any injection, in the experience of the reviewer, from a hypodermic of morphia to any of the less commonly used intravenous solutions,

*Fig. 52.*—Drawing to illustrate the site of insertion of the needle. Its fixation in relation to the vein is maintained by means of a small piece of strapping placed across the glass connection. The arm is anchored by a strip of bandage passing over the wrist, which is safety-pinned to the sheet.



may be given through a needle introduced into the tube carrying the saline solution to the vein. There are no reactions. Usually no attempt is made to keep the solution at body temperature as it enters the vein. Farquharson, however, recommends an ingenious and simple apparatus which accomplishes this.

**Selection of the Vein.**—The reviewer has usually employed the internal saphenous vein at the ankle. A small cannula is introduced after exposure of the vein through a small incision. The foot is loosely attached to the end of the bed by a clove hitch. Farquharson recommends the cephalic vein in the middle third of the radial side of the forearm. As this vein lies midway between the wrist and elbow-joint there is no need for a splint to restrain movements, which is always irksome to the patient. The arm lies alongside the body, loosely anchored to the sheet by a strip of bandage (*Fig. 52*).

**Needle or Cannula?**—In more than half the cases it will not be found necessary to expose the vein. In such cases a transfusion needle can be inserted, and in most instances a transfusion can be continued by this method for twenty-four to thirty-six hours. When a prolonged infusion is contemplated or where the

veins are small and difficult to identify it is better to tie in a cannula. A small piece of adhesive strapping placed over a glass connection near the cannula and a light dressing usually will secure fixation.

*"Description of the Apparatus.\*"*—The apparatus is depicted in Fig. 53. A rather larger reservoir than that usually described has been employed. This consists of a glass flask, of 20-oz. capacity, which is preferably of 'Pyrex' or other variety of heat-resisting glass. This is connected to a glass dropping tube, by a short length of rubber tubing, on which a screw clip is placed. The heat is thereafter applied to the fluid by allowing it to pass through a glass U-tube, which is placed in a Thermos flask of hot water. The glass U-tube

may be of the simplest pattern, or it may have a double bend, as shown in the diagram. The two limbs of the U-tube are carried through a rubber cork fitting the flask, or preferably, as illustrated, it is of advantage to have separate glass tubes passing through the cork, these being connected with the U-tube by short lengths of rubber tubing. This greatly diminishes the risk of breaking the U-tube in manipulation. One of the tubes passing through the cork is straight; this is connected to the dropping tube by rubber tubing of convenient length. The other, which is bent to a right angle for convenience, is for the attachment of rubber tubing leading to the vein. This length of tubing should be as short as possible, in order to minimize the heat loss between the flask and the vein.

"The cannula or needle is not attached directly to this tubing, but intermediate glass and rubber connections are added.

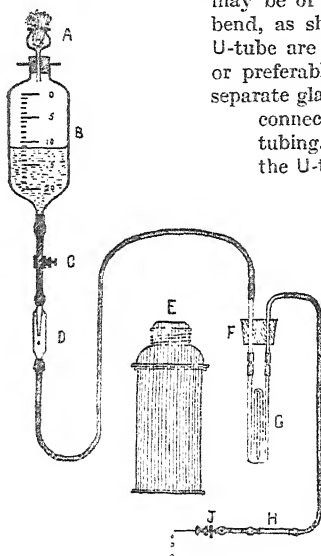


Fig. 53.—Diagram of apparatus. A, Rubber cork and filter funnel, with plug of sterile wool; B, Sterilizable glass flask, one pint capacity; C, Screw clip; D, Glass dropping tube; E, Thermos flask; F, Rubber cork; G, Glass U-tube with double bend; H, Glass connection; J, 'Record' fitting and needle.

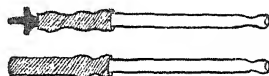


Fig. 54.—Alternative fittings for use with needle or cannula. (Figs. 52-54 by kind permission of the 'Edinburgh Medical Journal'.)

to the vein. Secondly, where a needle is used, its satisfactory insertion into the vein is noted by observing blood-staining of the clear fluid in the glass tube. Alternative fittings for needle or cannula are included in the apparatus, and are shown diagrammatically in Fig. 54.

*"Temperature of the Fluid."*—The reservoir is filled up with cold saline solution as often as is necessary (i.e., about every four hours at the 'normal' rate of flow). The heat is only applied as the fluid approaches the vein, by the U-tube and Thermos flask already described. The temperature of the fluid as it enters the vein is dependent, not only on the temperature of the water in the flask, but also on the rate at which it is flowing. At the rate usually advised for the

\* The apparatus has been made up for the author by Arch. Young & Son, Ltd., Forrest Road, Edinburgh.



'drip' method (i.e., *not exceeding one drop per second*), we have found that, to ensure the fluid entering the vein at *approximately* body heat, the temperature of the fluid in the Thermos flask should be between about 150°F. and boiling-point, these variations depending of course upon the length of tubing between the flask and the vein. Accordingly, as the water in the Thermos flask cools fairly rapidly, it is our practice to ask the nurse to refill the flask with boiling water every two to two and a half hours. At the beginning of each period, the temperature of the fluid entering the vein will be slightly above body heat, and at the end, slightly below. These variations are made necessary by the simplicity of the apparatus, and cannot be regarded as of any importance, the main point being that the chill is taken off the saline, and any danger of reaction following the absorption of cold fluid is avoided."

**Shock.**—R. R. Balbridge,<sup>2</sup> discussing the infusion treatment of shock, states that if the purpose is to restore blood volume or tissue fluid there is little logic in the use of hypertonic solutions. Their effect, due to high osmotic pressure, is to produce a temporary hydræmia at the expense of tissue fluids. Hypertonic solutions are sometimes logically employed when the object is to restore a substance which has become depleted or to reduce an œdema of some part, notably the brain. Balbridge's paper teems with common sense. He concludes by calling attention to the importance of dehydration as a factor in secondary shock and recommends the administration of physiological salt solution in large volume. The danger of overburdening the heart or producing pulmonary œdema and of increasing hæmorrhage by the intravenous administration of large quantities of fluid has been exaggerated.

**Post-operative Pulmonary Complications.**—H. H. Turnbull<sup>3</sup> deals with this subject. He thinks the sitting position with the patient fixed and not moving from side to side favours atelectasis. The exaggerated Fowler position certainly favours both atelectasis and thrombosis in large veins. The patient should be encouraged to breathe deeply at intervals and should be placed first on one side and then on the other at intervals during the day. If atelectasis actually occurs, the best treatment is *bronchoscopy* in skilled hands. The patient should be placed on the sound side; this will sometimes suffice to aerate the collapsed pulmonary area. The position may not be tolerated for long, but it should be tried from time to time during the day and combined with other measures such as the inhalation of *carbon dioxide*. This is administered for five minutes at a time three or four times daily. It is better to use a strong mixture (30 per cent). Support of the lower ribs by the nurse's hands and a hypodermic of morphia assist the patient in his respiratory endeavours.

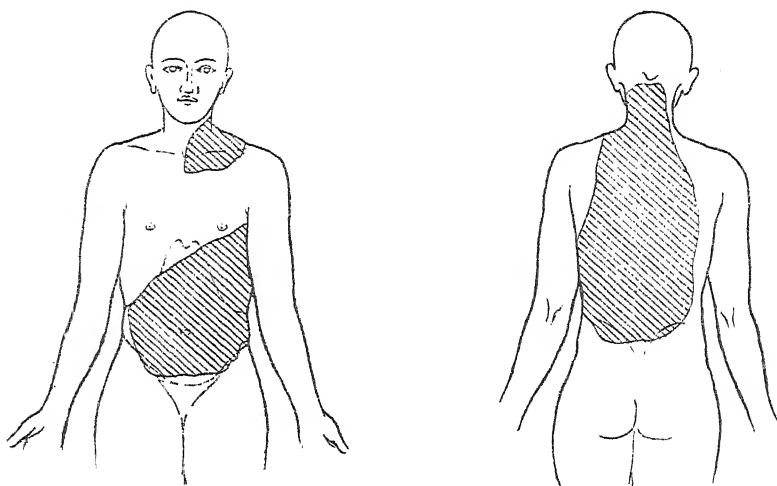
(See also PULMONARY EMBOLISM.)

**Post-operative Gangrene of the Skin.**—This condition occasionally arises from hæmolytic streptococcus infection, and is sometimes seen apart from any operation or trauma. After operation the causative organism is usually the *Staphylococcus aureus*. The condition has been referred to as progressive gangrenous infection of the skin and subcutaneous tissues following operation (MEDICAL ANNUAL, 1930, p. 243). There is a mild virulence and persistent spread even involving the cartilages of the ribs and sternum. The organism is rebellious to any form of treatment, but the process may be stopped by circumscribing the area by incision and packing the new wound with 1 per cent formalin changed under anæsthesia each day. Usually progressive gangrene of the skin follows appendix operations of a septic nature. As a substitute for the formalin application mentioned above a gutter may be cut with the actual cautery well beyond the affected area, or an electro-cautery knife may be used to excise the serpiginous edge of the process (MEDICAL ANNUAL, 1932, p. 195).

Steward Wallace<sup>4</sup> discusses the subject. He mentions a case of a remarkable and rare post-operative condition of a slowly progressive gangrenous infection of the skin and subcutaneous tissues. The gangrene followed upon the drainage of an empyema. After eight months the infection had spread from the occiput to the iliac crest behind and the whole abdominal surface was involved in front (*Plates LX, LXI, and Fig. 55*). There was a fatal termination. The following is his summary :—

1. A case of a rare complication suitably called "progressive post-operative gangrene of the skin" is described. The importance of using a definite nomenclature to facilitate recognition and reference is emphasized.

2. Only one other case has been recorded in England, but 37 cases have been collected from the foreign literature and reviewed. Their similarity justifies grouping them together as an entity.



*Fig. 55.*—Diagram to show extent of lesion at death (thirty-second week).

3. The rarity of the condition is shown by an analysis of all cases of post-operative gangrene of the abdominal and chest wall occurring in the London Hospital from 1903–33. One case only may be an example of "progressive post-operative gangrene of the skin", but the evidence available is too scanty to include it in the series.

4. The most characteristic features are : Its occurrence usually after drainage of an appendix abscess or empyema ; the slow but steadily progressive spread ; the involvement of superficial tissues only ; the raised, oedematous, undermined, and exquisitely tender edges ; the relatively healthy base of red granulation tissue ; the healing of the original sinus ; the extensive area involved unless checked ; and its failure to respond to any non-operative therapeutic measures.

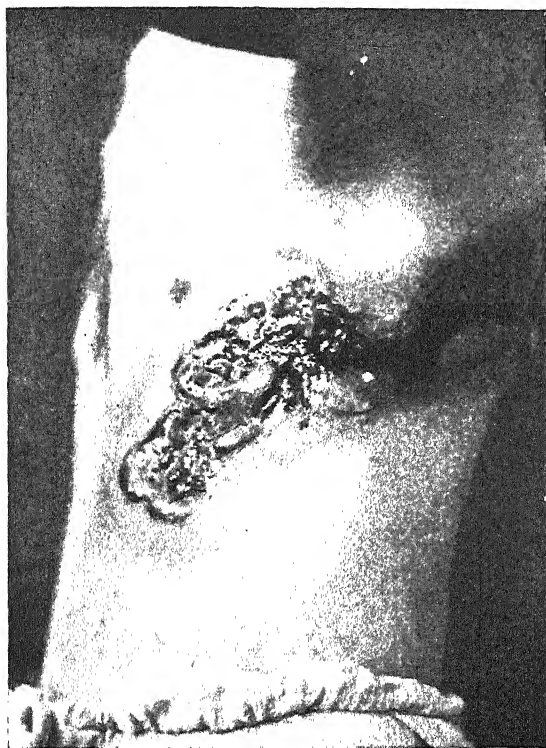
5. Treatment consists of early recognition and excision of the entire lesion, or, if first seen in the later stages, of excision of the advancing edges with the cautery. The results are immediate and gratifying.

6. Bacteriological experiments suggest that it is due to the synergistic activity of a symbiosis of a micro-aerophilic streptococcus present in the pleural or peritoneal exudate and a non-specific staphylococcus introduced from without. Tension sutures appear to play a part in the establishment of the infection.

*PLATE LX*

PROGRESSIVE POST-OPERATIVE GANGRENE OF SKIN

(A. M. STEWART-WALLACE)



Lesion on the fifty-ninth day after operation: antero-lateral view.

*Plates LX, LXXI by kind permission of the 'British Journal of Surgery'*

*PLATE LXI*

PROGRESSIVE POST-OPERATIVE GANGRENE OF SKIN—*contd.*

(A. M. STEWART-WALLACE)



Lesion on the fifty-ninth day after operation: postero-lateral view.

Cutaneous hypersensitivity (similar to the Arthus phenomenon) may be an important etiological factor.

7. The condition is little known in this country. Failure to recognize it may lead to failure to carry out the only effective treatment, with consequent death of the patient or months or even years of pain and suffering.

REFERENCES.—*Edin. Med. Jour.* 1934, xli, Sept., 530; *Ann. of Surg.* 1934, Aug., 266; *Austral. and N.Z. Jour. Surg.* 1935, Jan., 246; *Brit. Jour. Surg.* 1935, April, 642.

**PREGNANCY.** (See also HEART DISEASE—HEART DISEASE IN PREGNANCY; RENAL DISEASES—PREGNANCY TOXÆMIA AND NEPHRITIS; SEX HORMONES—PREGNANCY TESTS; THYROID SURGERY—HYPERTHYROIDISM IN PREGNANCY; TUBERCULOSIS, PULMONARY—PREGNANCY AND TUBERCULOSIS.)

### PREGNANCY AND DIABETES.

*Beckwith Whitehouse, M.S., F.R.C.S., F.C.O.G.*

The influence of pregnancy upon diabetes and vice versa has recently been studied by D. W. Kramer<sup>1</sup> from clinical material in his own experience and the records of 238 cases in the literature. The author states that although the effect of pregnancy upon a diabetic varies considerably in different patients, and that actual improvement may be shown in some cases, it is important to note that the maternal death-rate is comparatively high. In 238 pregnancies there were 8 deaths, a figure which corresponds to a rate of 3.3.6 per 1000 total births. If the deaths which occur within one to three years after birth are also included, the high figure of 7.9 per 1000 births is obtained. The risk to the child is also considerable, 1 labour in 5 resulting in a still-birth, contrasted with a rate of 1 in 25 in non-diabetics. These increased risks are partly the result of over-development upon the part of the child, which in diabetic patients is not unusual. This naturally tends to make labour more prolonged and difficult and to increase the liability to trauma. Another factor in the causation of still-births is acidosis. This is probably more common in the diabetic pregnant patient than is commonly supposed. Kramer observes that it may exist with few or no symptoms and probably explains some cases of coma which occur with no apparent cause. An interesting fact associated with diabetic pregnancy is the increased tendency to *hydramnios*. The author quotes E. Skipper,<sup>2</sup> who found an incidence of this complication of 27 per cent. Since the use of insulin these figures have been reduced to 11 per cent.

In the management of diabetes and pregnancy co-operation between the patient and her physician is imperative. Strict adherence to diet is essential and frequent observations of the urine and blood must be made. Whilst the diet should be ample for the maternal needs, it is important to bear in mind the tendency to over-development of the fœtus. During the later months of pregnancy the patient should be advised to enter hospital or nursing home for a few days periodically so that acidosis may be studied, the dosage of insulin standardized, and the danger of coma minimized as far as possible. Labour should only be induced in the presence of coma or in an attempt to deliver a live child when there is the risk of complication from over-size, or a previous history of still-births. Natural delivery is preferable if possible, and spinal or gas anaesthesia should be used. Caesarean section is only indicated in the presence of any complications likely to necessitate much manipulation *per vias naturales*.

During the puerperium careful observation of the blood-sugar must be maintained, and the insulin dosage regulated accordingly. Hypoglycæmic shock and coma are always possible developments, and without proper blood

studies it may be difficult to differentiate between the two. With the onset of lactation, the blood-sugar may drop and the dose of insulin must be promptly diminished. On the question as to whether a diabetic mother should nurse her child, Kramer observes that he does not see any danger if the mother's condition permits, but he qualifies this statement by noting that he "thinks it will be to her advantage if the responsibility of breast-feeding can be obviated."

Summarizing the whole position, the author considers that the outlook for a mild or moderately severe diabetic patient who becomes pregnant is fairly good, provided she observes the rules. With the severe diabetic, however, the margin of safety is too narrow. The patient *may* go through the period of gestation without mishap, but the danger of acidosis and coma is always present. Further, the diminished chances of the patient producing a living child should not be overlooked by the physician, when his advice is sought upon the question of a prospective pregnancy.

REFERENCES.—<sup>1</sup>*Amer. Jour. Obst. and Gynecol.* 1935, xxx, July, 68; *"Quart. Jour. Med."* 1933, ii, 360.

#### **PRIAPISM, PERSISTENT.** (See PENIS, SURGERY OF.)

#### **PROSTATE, SURGERY OF.**

*Hamilton Bailey, F.R.C.S.*

**The Treatment of Chronic Prostatitis.**—O. Grant<sup>1</sup> advocates treating chronic prostatitis by a novel method. The type of case in which his form of treatment is applicable is that of the chronic stage after the acute infection has subsided. It is immaterial whether the infecting organism is the colon bacillus, staphylococcus, or gonococcus. First of all, under local anaesthesia, vasotomy is performed, and 1 per cent mercurochrome is injected into both seminal vesicles. In addition, the interior of the prostate is filled with the same solution by puncturing the prostatic capsule via the perineum. For the latter gas anaesthesia is necessary. Before the puncture the bladder is filled, so as to depress the prostate towards the perineum. With the patient in the lithotomy position, the needle is guided by the left index finger in the rectum and the prostatic capsule is entered. Moving the point of the needle hither and thither, 5 to 10 c.c. of 1 per cent mercurochrome are injected into the prostate, considerable pressure being required to force the fluid into the gland. The prostate is then massaged by the finger in the rectum so as to disseminate the mercurochrome. Then the bladder is emptied. Grant says: "The procedure requires some practice and a little skill, and the immediate results are not always brilliant, but the injection accomplishes its purpose of deterring or destroying the infecting organism, and the usual course of the disease is much shortened."

**Prostatic Calculi.**—Prostatic calculi are not infrequent. They are divided into two classes—endogenous and exogenous. The endogenous variety are formed within the prostate itself and are much more frequent. The exogenous are the result of a calculus from the upper urinary tract becoming lodged in the prostatic urethra and there abiding and increasing in size. The endogenous variety are again divided into two classes, those associated with benign hypertrophy of the prostate and those which are not. The latter are nearly twice as common as the former. It is commonly believed that many prostatic calculi arise from the corpora amylacea. H. H. Young<sup>2</sup> has been unable to demonstrate amyloid in the nuclei of stones examined. The stones are composed mainly of calcium oxalate and phosphate which cast an excellent X-ray shadow.

**ETIOLOGY.**—A previous history of gonorrhoea was obtainable in 45 per cent of cases. Young believes that infection of the prostate is the principal cause of these stones.

**SYMPTOMATOLOGY.**—Stones in the prostate may be present for many years without giving rise to symptoms. In younger subjects the symptoms are often those of a urethral stricture, and occasionally the passage of a sound and a metallic 'click' in the prostatic urethra calls attention to the true nature of the case. In older subjects the symptoms are often those of enlargement of the prostate. The hard nodules which are the calculi have many times been mistaken for inoperable carcinoma of the prostate when a rectal examination has been made. Sexual powers are impaired very little by the presence of prostatic calculi.

X-rays are the means of confirming the diagnosis absolutely. In order to get a good picture of the stones it is necessary to have the prostatic shadows unobscured by the pelvic bones. The patient should lie on the X-ray couch with his feet dropped down and resting upon a low stool. A firm pillow is placed beneath the small of the back, and the correct tilt of the pelvis can be enhanced further by a pillow beneath the shoulders. The shadows cast by prostatic calculi tend to assume the form of a horseshoe or ring.

**TREATMENT.**—If the stones are causing symptoms they must be removed. This can be accomplished in a variety of ways. In some cases it is possible to preserve the prostate.

**Enlargement of the Prostate.**—It has long been thought that senile enlargement of the prostate will one day be controlled by endocrine therapy. This hope has not yet been fulfilled, but there has been some suggestive experimental work. H. Burrows<sup>3</sup> found the administration of œstrin to male mice resulted in prostatic enlargement, particularly the utriculus masculinus. That œstrin can produce prostatic enlargement in the human subject is indicated by the fact that the prostate of the male infant is enlarged considerably at birth, and later diminishes in size when removed from the influence of maternal œstrin, which is produced in large amounts during pregnancy. The question of prevention and cure of the enlarged prostate would seem, therefore, to involve finding the origin of the œstrogenic compound in the male and then evolving a method for its neutralization.

A. S. Parkes and S. Zuckerman<sup>4</sup> believe that prostatic enlargement is associated with a male hormone deficiency, and that male hormone therapy is indicated. They injected ten immature male monkeys and one baboon for periods of six to twenty-eight days with an oil solution of œstrone. This brought about a diminution in the number of prostatic follicles and an increase in the amount of fibromuscular stroma.

**Prostatectomy.**—W. A. Page<sup>5</sup> describes the late Professor Andrew Fullerton's technique of prostatectomy, which was very successful. When preliminary drainage was necessary an indwelling catheter was used. In only 1 of 31 cases was a two-stage operation carried out. General anaesthesia was employed and the aim of the operation was speed. The prostate was enucleated in the usual way and one of Professor Fullerton's special bags was inserted. A large rubber drainage tube was employed in the suprapubic wound. After the bag was removed a de Pezzer catheter was inserted, and because the original suprapubic incision was very small, this soon gave bladder drainage without leakage around the tube. The majority of patients were up on the sixth day. Daily bladder washes were performed by inserting the nozzle of a Higginson's syringe into the urethra and allowing the fluid to escape by the de Pezzer catheter. In this way sloughs, and other debris, were driven out. The solution used was 1-1000 silver nitrate. The de Pezzer catheter was kept in the bladder until the wash had been quite clear for three or four days. When the de Pezzer catheter was removed the urethral catheter was inserted once more, after which the suprapubic wound healed rapidly.

For bad-risk cases J. D. Barney and S. B. Kelly<sup>6</sup> extol the two-stage operation of prostatectomy. They find that the mortality of apparently hopeless cases of prostatic obstruction can be kept to a low figure by careful and prolonged drainage. By prolonged drainage they mean several months, and cite cases in which drainage had been maintained for twelve months or more. In the meantime, the patient had been able to return home and in many cases resume employment. Prostatectomy has been made safer by the simple expedient of not being in a hurry. While these authors do not under-estimate the great value of laboratory findings, they emphasize the necessity of exercising clinical judgement in making the final estimate as to the fitness of the patient to undergo the second operation. Suprapubic drainage when properly executed, and with a suitable tube, preferably a mushroom-ended catheter, can be comfortable. Bilateral vasectomy is a most important procedure in the prevention of needless and sometimes fatal orchitis in old and enfeebled patients.

**THE HARRIS OPERATION.**—S. H. Harris<sup>7</sup> writes further details of his now well-known operation of prostatectomy with closure of the bladder. He uses a transverse abdominal incision through the skin and fat one inch above the level of the symphysis pubis. He draws attention to the importance of commencing enucleation of the prostate by breaking through the mucosa intra-urethrally, and thus preserving the verumontanum. A modification of his original practice is the introduction of the principal sutures which reconstitute the prostatic bed higher up than formerly. The boomerang needle is introduced at the level of the interureteric bar.

**After-treatment.**—At the termination of the operation, before the patient leaves the table, a few syringe-fuls of 1–3000 silver nitrate combined with 4 per cent citrate of soda are run backwards and forwards through the catheter to remove clots. The catheter is then connected up to a sterile glass bottle. During the first twenty-four hours the bladder is irrigated with not more than one ounce of the aforementioned solution on two, three, or four occasions. After the first twenty-four hours the sodium citrate is omitted from the solution. Irrigation beyond the amount necessary to ensure that the catheter is not blocked is deprecated, and after the first few days irrigations are stopped altogether.

**PREVESICAL PROSTATECTOMY.**—L. C. Jacobs and E. J. Casper<sup>8</sup> describe yet another method of performing prostatectomy. The organ is enucleated through the prevesical space. The bladder is distended and the usual suprapubic incision made. The extraperitoneal space between the bladder and the pubis is opened up. By mobilizing the bladder the fibrous coat and the pubo-prostatic ligament are encountered. The bladder is emptied and a straight sound is passed. Through a longitudinal incision the sheath of the prostate is opened, and the prostate is enucleated. Often the prostate can be removed without opening the urethra. The prostatic sheath is sutured and the prevesical space drained.

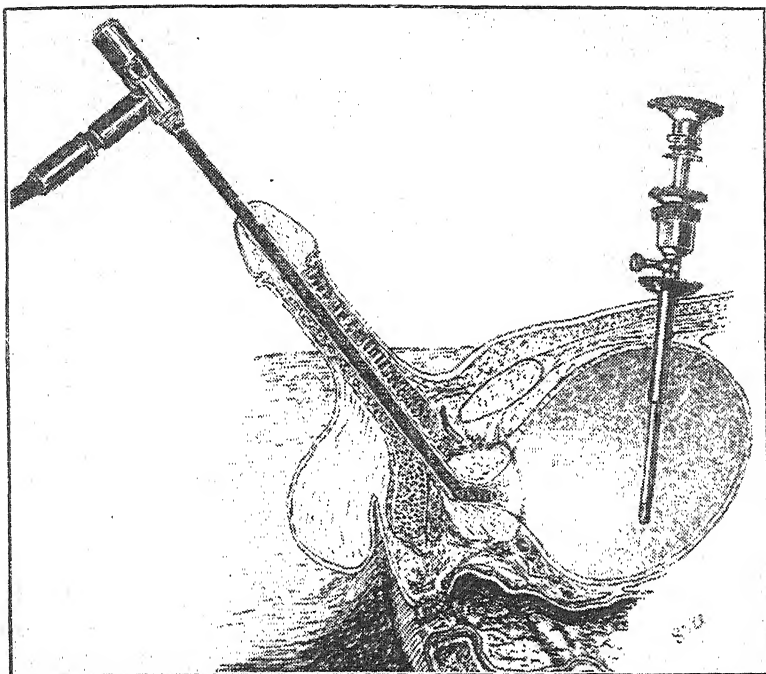
**The Conservative Treatment of (Early) Prostatic Enlargement.**—At the thirty-third French Congress of Urology the subject of treatment of hypertrophy of the prostate by means other than prostatectomy was discussed. E. Papin<sup>9</sup> (Paris) and O. Pasteau<sup>10</sup> (Lyons) both regard treatment by X rays as practically valueless. They also deny emphatically that ligature of the vasa (the so-called Steinach operation) has any effect on prostatic hypertrophy. The majority of the French surgeons appeared not to be over-enthusiastic about trans-urethral resection.

M. Hühner<sup>11</sup> says the mere fact that the prostate gland, as felt per rectum, is enlarged distinctly is not, in itself, an indication for operation; neither is the fact that the patient has to arise several times at night to urinate, nor that



a small amount of residual urine is present. Some of these patients can be kept comfortable for a considerable time, perhaps for years, by conservative treatment. The patient presents himself with a full bladder every fifth day and the prostate is massaged per rectum very gently; this is followed by an instillation of weak silver nitrate solution. If improvement sets in, perhaps only one or two treatments per year are necessary.

**Transurethral Resection.**—H. Williams<sup>12</sup> uses a method of transurethral resection devised by himself. The principle will be clear by a reference to *Fig. 56*. The diathermy current is applied to the obstructing prostate by way of the urethral instrument and the excision of prostatic tissue is observed



*Fig. 56.*—H. Williams's method of diathermy excision of obstructing prostatic tissue. The cystoscope should have been shown as entering the bladder nearer the pubic symphysis and in a vertical direction. (*By kind permission of the 'British Medical Journal.'*)

through the suprapubic cystoscope. A review of 29 cases five years after this operation showed that 50 per cent were relieved completely, and a further 22.2 per cent had partial relief.

R. W. Doyle and G. Y. Feggetter<sup>13</sup> investigated 156 cases of transurethral resection performed at All Saints' Hospital. They find that the best results followed operations for middle-lobe enlargements and fibrous bladder-neck contractions. The full benefits of the operation are not experienced until three months after the resection.

J. S. Joly<sup>14</sup> has examined eight specimens of the prostate removed from patients who had previously undergone resection. The interval varied from one to three years. Careful examination showed that the glandular tissue

behind the urethra was absent or considerably reduced in amount, but the lateral lobes were typical of benign hypertrophy, both macroscopically and microscopically.

N. G. Alcock<sup>15</sup> considers that infection is more common following transurethral resection than following prostatectomy. Also, he points out that following resection many patients show a distressing frequency of urination which continues for weeks or months, but in the majority of them it disappears eventually.

C. A. Pannett<sup>16</sup> remarks that it is probable that the risk of transurethral resection for simple adenomata is not materially less than prostatectomy.

G. J. Thompson and E. N. Cook<sup>17</sup> treat chronic prostatitis and prostatic calculi by transurethral diathermy. In the case of prostatitis the infected diverticula are drained by making adequate openings by means of electro-coagulation. When calculi are present in these pockets after electro-coagulation the mouths of the pockets are large enough to allow the stones to escape.

**Median-bar Obstruction.**—S. H. Harris<sup>18</sup> has applied his principles of prostatectomy to median-bar obstruction. The operation may be regarded as a companion to Harris's operation of suprapubic prostatectomy with closure. After lateral sutures have been placed with the boomerang needle a wedge of median bar is excised. When hæmostasis is complete retrigonization is carried out in the same manner as in Harris's prostatectomy, all raw surfaces being obliterated (*Plate LXII*). The author has carried out the operation 33 times without mortality and without recurrence of the obstruction.

**Carcinoma of the Prostate.**—E. R. Mintz and G. G. Smith<sup>19</sup> have studied the necropsy findings in 100 cases of carcinoma of the prostate. Local extension of the growth into the bladder had occurred in 50 per cent. The seminal vesicles were involved in nearly 60 per cent. Invasion of the rectum is comparatively rare. Metastases in the lung and the liver were fairly common. Osseous metastases were recorded in only 21 of the 100 cases, the vertebræ, pelvic bones, and ribs heading the list.

**TREATMENT.**—Treatment of carcinoma of the prostate is exceedingly unsatisfactory. Radium in the hands of most surgeons has only added to the misery of the patient. Transurethral resection has been advocated widely as a palliative measure, but, as H. T. Mursell<sup>20</sup> points out, the partial removal of a malignant growth in any part of the body sometimes accelerates the growth, and the prostate is no exception. The only cure for carcinoma of the prostate is radical removal of the organ, which includes the prostatic capsule. H. H. Young<sup>21</sup> has had a large measure of success with this operation. In view of the hopelessness of all other methods of treatment it would appear that his teaching should be accepted more widely.

REFERENCES.—<sup>1</sup>*Jour. of Urol.* 1935, xxxiii, 631; <sup>2</sup>*Ibid.* 1934, xxxii, 660; <sup>3</sup>*Amer. Jour. Cancer.* 1935, xxiii, 490; <sup>4</sup>*Lancet*, 1935, i, 925; <sup>5</sup>*Brit. Med. Jour.* 1935, i, 578; <sup>6</sup>*New Eng. Jour. Med.* 1934, cexi, 1127; <sup>7</sup>*Austral. and N.Z. Jour. Surg.* 1935, iv, 226; <sup>8</sup>*Urol. and Cutan. Rev.* 1933, xxvii, 729; <sup>9</sup>*Presse méd.* 1933, xli, 1670; <sup>10</sup>*Ibid.* 1691; <sup>11</sup>*Med. Record*, 1934, cxl, 177; <sup>12</sup>*Brit. Med. Jour.* 1934, ii, 549; <sup>13</sup>*Ibid.* 1935, i, 147; <sup>14</sup>*Lancet*, 1934, i, 48; <sup>15</sup>*Jour. Amer. Med. Assoc.* 1935, civ, 734; <sup>16</sup>*Lancet*, 1934, i, 911; <sup>17</sup>*Jour. Amer. Med. Assoc.* 1935, civ, 805; <sup>18</sup>*Brit. Jour. Surg.* 1935, xxiii, 45; <sup>19</sup>*New Eng. Jour. Med.* 1934, cexi, 479; <sup>20</sup>*South African Med. Jour.* 1935, ix; <sup>21</sup>*Amer. Jour. Surg.* 1935, xxviii, 32.

## PSYCHOLOGICAL TREATMENT AND ITS RESULTS.

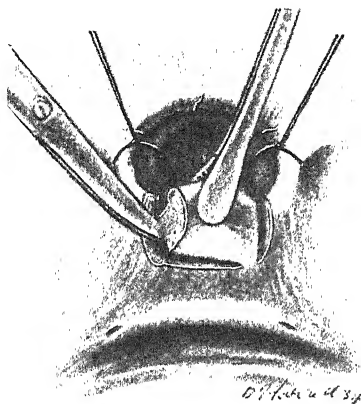
H. Devine, M.D., F.R.C.P.

**Psycho-analysis in America.**—L. Kessel and H. T. Hyman<sup>1</sup> have written an article giving a review of the psychotherapeutic results obtained by competent and complete analysis of 33 patients. The number quoted is small, but when it is realized that each case takes an average period of sixteen

PLATE LXII

BLOCK EXCISION OF BLADDER NECK  
FOR MEDIAN-BAR OBSTRUCTION

(S. HARRY HARRIS)



*Fig. A.*—Excision of wedge of median bar: vertical incisions complete.  
Block-excision in progress.



*Fig. B.*—Retrigonization complete: the apex of the tritone sewn well down into  
the prostatic urethra. All raw surfaces obliterated.

*By kind permission of the 'British Journal of Surgery'*



months, working for three to five days a week, and that a corresponding economic factor is involved, it becomes evident that large numbers cannot be collected within any reasonable time. These cases were submitted by the writers, who were themselves general physicians, to analysts approved by the New York Psycho-analytic Society. Patients suffering from definite psychoses were not benefited by treatment. Patients suffering from behaviour problems and maladjustments, from simple neuroses and psychoneuroses, or from visceral symptoms of a functional nature, were treated with varying success. Of the 33 cases submitted, results were classified as bad in 16: of these, 7 were psychotics and the rest maladjustments of various sorts. Four results were classified as good, with qualifications. In these the patients became symptom-free, but the authors consider that the results might be attributed to sexual satisfaction as much as to the analysis. Since this sexual satisfaction was experienced outside marriage the beneficial nature of the cure, from the standpoint of society, may be called in question, although, as is pointed out in the editorial comment, improvement of marital relations is a more frequent outcome of analysis than is divorce. Thirteen cases are classified as satisfactory psychic results. Five of these were cured, and in the opinion of the authors this could not have been brought about by any other method. Five showed improvement though the cure was not complete, and in 3 instances of behaviour problems the analyst succeeded in producing the desired result without the conclusion of a formal analysis. It is interesting to note that the five cured patients were all of the intellectual class and all under 30.

The authors sum up the limitations of psycho-analysis as follows: (1) At the present time its practice is sharply limited to a small group of adequately trained physicians who cannot possibly handle more than a numerically trifling number of patients annually. (2) The more severe mental illnesses such as psychoses and drug addiction, in which the need for treatment is greatest, have least expectation of assistance. It is possible and even probable that the less severe varieties of mental illness are amenable to methods less complex and less expensive than complete analysis. (3) Further, those who can benefit from this method of therapy apparently require to be under 40 years of age, of a high standard of intellect, and economically well endowed.

**Psycho-analysis at the Berlin Psycho-analytic Institute.**—I. Hendrick<sup>2</sup> has embodied in his book, *Facts and Theories of Psycho-analysis*, a report of the therapeutic results of treatment at the Berlin Psycho-analytic Institute over a ten-year period. 'Cured' is defined in the psycho-analytic sense of an essential personality-change resulting from a fundamental redistribution of instinctual energy formerly exploited by the neurosis, and as far as possible the cure is checked by post-therapeutic follow-ups. 'Much improved' denotes an essential and worth-while change, but with considerable evidence of neurosis persisting; most of these would be 'cured' by a short second period of analysis. Symptomatic cures resulting, not from a fundamental change in the personality dynamics, but from the temporary effects of the therapeutic relationship on the symptoms, are classified as 'improved'. Cases in which the analysis was 'interrupted' are chiefly those doubtful ones where a short trial was made, and terminated by a negative recommendation as 'incurable' by the analyst. The compiler calls attention to the fact that these results are somewhat less satisfactory than those of private practice, for the following reasons: First, nearly half of the treatments were given by students undertaking their first analyses, though their failures were much reduced by the instruction and careful clinical supervision obtained at the Institute. Secondly, a larger number of cases involved novel problems than in private practice. Thirdly, economic and other practical considerations more often

Table I.—CORRELATION OF DIAGNOSIS, DURATION OF TREATMENT, AND RESULT,  
POLYCLINIC OF THE BERLIN PSYCHO-ANALYTIC INSTITUTE (1920-9).

DIAGNOSIS	CASES			DURATION OF COMPLETE TREATMENTS				RESULT			
	Total	Incomplete Treatment	Complete Treatment	Months			Longer	Unhealed	Improved	Much Improved	Cured
				6	12	18	24				
<i>Psychoneuroses, etc.</i>											
Anxiety hysteria	57	25	32	11	4	7	5	5	10	6	14
Hysteria and hysterical character	105	31	74	19	22	18	7	8	22	21	25
Compulsion (and obsessional) neuroses and character-acters	106	35	75	11	17	11	15	17	18	26	21
Neurotic inhibitions (including genital dysfunction)	80	24	56	6	17	16	7	10	5	15	21
Neurotic depressions	37	13	24	4	8	2	5	5	10	5	7
Stuttering	13	3	10	2	3	—	3	2	3	1	3
Tics	4	2	2	—	1	1	—	—	—	—	—
Character disturbances	37	7	30	7	6	11	4	2	12	8	6
Homosexuality	8	4	4	—	4	—	—	—	4	—	1
<i>Psychoses</i>											
Manic-depressive disturbances	14	5	9	1	3	1	2	2	4	2	1
Schizophrenia and schizoid personality	45	26	19	4	7	4	2	2	8	2	1
Paranoid	2	1	1	—	—	—	—	—	1	—	—
Psychopathy	23	18	5	—	3	—	—	2	—	—	1
<i>Neurasthenia and anxiety neuroses</i>	10	7	3	—	1	2	—	—	2	1	—
<i>Organic conditions</i>											
Bronchial asthma	2	1	1	—	1	—	—	—	1	—	—
Epilepsy	6	5	1	—	1	—	—	—	—	—	—
Total analytic treatments	604	241	363	70	108	74	51	60	116	88	111

lead to premature termination of treatment; for example, the practical necessity of patients from other cities returning home, and the imminent need of many of the patients to leave Berlin to earn a livelihood.

*Table I* on the previous page is an abbreviation of the reports compiled by Dr. Otto Fenichel.

**Psychotherapy at the Maudsley Hospital.**—W. Lindesay Neustatter<sup>2</sup> summarizes the results obtained in the treatment of 50 patients at the Maudsley Hospital during 1933. Their ages ranged from 17 to 48, and 12 of them were women; they were referred to him from the out-patient department by other members of the staff, and were seen for half an hour at a time. The maximum number of interviews was three per week; the minimum cannot be fixed, but some of the patients were seen only once every two or three weeks.

Unfortunately there is no objective standard by which a 'cure' can be measured. Ability to return to work is one criterion accepted by the Maudsley Hospital for the use of the term 'recovered', but as many of his patients remained at work during their treatment, it cannot be applied here. The cases have therefore been classed as 'improved' and 'unimproved', the former group being subdivided as follows: 'slight'—this merely implies that the patient felt somewhat more comfortable than he did to begin with—his symptoms were either less intense, or attacks were somewhat less frequent; 'moderate'—the patient's symptoms showed a satisfactory diminution in intensity or frequency, but nevertheless had not disappeared; 'considerable'—complete or almost complete disappearance of symptoms. The terms are not satisfactory, depending as they do on a mixture of the physician's observations and the patient's own assessment of his feelings. In functional disorders, however, the patient's comfort and ability to carry on are so far linked with subjective conditions that his feelings may be allowed relatively greater weight.

The four types of treatment used may be described as follows:—

**Medicine and Reassurance.**—The nature of the symptoms was explained to the patient. He was told that other people had similar ones, that there was no danger (especially of insanity), and that he would recover. The medicine given depended on the conditions present; usually pot. brom. was employed, though occasionally a placebo such as mist. gent. c. sod. was prescribed. If there was any organic disorder this was treated appropriately, but not during analytic treatment. It was found inadvisable for the psychologist to act as the general medical attendant, and the patient's own doctor was enlisted to deal with such problems.

**Suggestion.**—Here the patient was made to lie down, and a slightly hypnoidal state was induced. Suggestions of recovery were made, both general and specific for the symptoms.

**Psychological Talks.**—The patient was seen once or twice a week. His history was gone into, and his symptoms reviewed, and explained in the light of their apparent etiology.

**Analytic.**—The patient was made to lie down. Free association, with or without the use of dream material, was employed. The transference was analysed. The patient was never seen less than twice a week, and usually three times. Treatment extended over some months, though never above nine and rarely longer than six. Sessions lasted half an hour.

The following summary is presented:—

1. **Results in Different Types of Cases.**—Fifty cases of functional nervous disorders were treated during the year. Of these, 31 improved, 2 got worse, and the others remained unchanged. The results may be grouped as follows:—

Anxiety states improved	..	..	..	..	16 out of 24
Depressives improved	..	..	..	..	9 " 11
Obsessionals improved	..	..	..	..	1 " 3
Hysterics improved..	..	..	..	..	4 " 6
Frigidity improved	..	..	..	..	1
Schizophrenics failed to improve	..	..	..	..	4
Behaviour problem improved considerably	..	..	..	..	1

2. *Methods Employed*.—Improvement was noted in 7 out of 10 cases treated analytically, in 12 out of 25 treated by psychological talks, in 11 out of 16 treated by reassurance and medicine, and in 2 out of 2 treated by suggestion.

3. *Prognosis*.—(a) The severity of the attack appeared to bear no relation to response to treatment. (b) Domestic, financial, and business worries seemed to play no significant part in determining the outcome of the treatment of a neurotic condition not specifically caused by one of these factors. (c) Sex life was unsatisfactory in 50 per cent of cases who failed to improve, compared with 14 per cent of those who did. Worry over masturbation was often present. (d) Obsessional, hypochondriacal, egotistical, and somatic features make the prognosis worse.

*Conclusion*.—From the small number of cases investigated it appears that psychotherapy is of value, since approximately two-thirds of the cases improved. There is no evidence to show that any one method of treatment was predominantly successful over the others, but each has its successes. At present the choice must be a matter for individual judgement and predilection. Nevertheless, the results of investigating prognosis in relation to character give some indication of the type of person most likely to respond to treatment, and give some guidance about the advisability of spending much or little time on a given patient.

**Psychotherapy at the Tavistock Clinic**.—M. C. Luff and M. Garrod<sup>4</sup> write on the after-results of psychotherapy in 500 adult cases. The attention of the medical profession has, during recent years, been increasingly directed towards psychotherapy, but the claims for this method of treatment are sometimes criticized on the ground that they are too often based on successes in individual cases. Since the foundation of the Institute of Medical Psychology in 1920 at the Tavistock Clinic, the number of patients treated there each year has steadily increased. It has therefore been possible to collect from the Institute's records a considerable volume of material by which the effectiveness of psychotherapy as a remedial measure may be judged.

The results of psychotherapy cannot fairly be judged by the patient's condition at the termination of treatment. He may then appear very much improved and his symptoms may have completely disappeared, but he has still to prove his capacity to withstand without further breakdown the stresses that life will inevitably bring. Only time can show whether treatment has given him this capacity. Further, a serious criticism made of psychotherapy is that, although benefit may be apparent, the improvement is really due to the patient's reliance and dependence on the physician, and is not likely to be lasting. In fact, it has been suggested that psychoneurotic symptoms indicate an inherent personality defect which cannot be 'cured'. These criticisms can only be conclusively answered by collecting on a large scale information concerning the remote, as well as the immediate, results of psychotherapy. In this paper a step is made towards the provision of such information.

With these considerations in mind the writers have followed up as a routine all patients discharged from treatment at the Institute since 1930. This follow-up covers a period of three years after discharge, and during this time at least three reports on the patient's condition have been collected. The information is usually obtained by letter from the patient himself or from his



private doctor. In some cases, however, a return visit is made to the physician who treated him at the Institute, and in others a social worker calls at his home. Whenever possible information from several of these sources is considered. If the patient himself, his relatives and friends, or the Institute physician give continuously favourable reports, it is fair to judge the result of treatment as successful.

*Assessment of Results.*—At the termination of treatment a summary of the case is made by the physician, and on his judgement the patient is placed in one or other of four groups, under the heading 'condition on discharge'. At the end of the follow-up period the case may either remain in the same category or may be promoted or degraded according to the reports received.

The four headings used for statistical purposes are : (1) 'Much improved'—The patients are free from symptoms, leading normal lives, and usefully employed ; they are able to meet difficulties with self-confidence and courage and without relapse into neurosis. (2) 'Improved'—Reports indicate that the patients have been much benefited by treatment ; they have become self-supporting members of the community and are able to withstand the ordinary stresses of every-day life, but are liable to show some return of symptoms if they have to meet a particularly difficult situation such as family bereavement or unemployment. Under such stresses they do not relapse into a 'break-down', but may need to return to the Institute for one or a few interviews to assist their readjustment. (3) 'Slightly improved'—Those who have benefited to some extent from treatment, but have never become free from all symptoms and are liable to break down again under strain. (4) 'Not improved'.

*Statistical Material.*—The group of 500 adult patients covered by these statistics were treated at the Institute between October, 1928, and the end of 1931. Cases have been taken consecutively from the records, omitting only those whose follow-up has not extended for three years after discharge. During this period 710 adult patients were discharged from treatment and 210 of these were lost sight of, so that it has been possible to follow up 70·4 per cent.

Patients who disappear from observation before the end of the follow-up period form a difficult and disappointing factor in recording results. Some were untraceable owing to unnotified change of address, and others, although written to at least twice, failed to reply. It might seem that patients who had received little or no benefit from their treatment would be more likely to lose touch with the Institute than those who had done well, but careful consideration of the summaries of the untraceable cases does not confirm this supposition. They do not belong preponderantly to any one group as regards either diagnosis or result of treatment as assessed on discharge, and a number of them reported favourably for one or two years before ceasing to reply. In this connection it is perhaps worth mentioning that unimproved neurotic patients are often only too willing to take the opportunity of pouring out an account of their persistent symptoms, and of expressing their dissatisfaction with an institution that has failed to help them, whereas those who are freed from symptoms are sometimes glad to bury the past and lose touch. The point in question is, however, of great importance, for if unimproved patients do preponderate among those who disappear from the follow-up record, the 500 cases upon which these statistics are based are not strictly unselected, and the results will appear to be unduly favourable. The following figures are therefore given to show the results of treatment in the untraceable cases, as estimated by the physician at the time of discharge :—

	Per cent		Per cent
Much improved	.. 18·1	Slightly improved	.. 25·7
Improved ..	.. 40·0	Not improved	.. 16·2
			24

Table II.—RESULTS OF TREATMENT ON DISCHARGE AND AFTER THREE YEARS (TAVISTOCK CLINIC).

DIAGNOSIS	NUMBER OF CASES	CONDITION ON DISCHARGE				CONDITION AFTER THREE YEARS						PERCENTAGE REMEDIED		
		Much Improved	Improved	Slightly Improved	Not Improved	Much Improved	Improved	Slightly Improved	Not Improved	Further Treatment at Institute	Further Treatment Elsewhere	Total	On Discharge	3 Years After
Anxiety states	220	72	104	30	14	74	67	11	32	8	22	6	80.0	64.0
Hysteria ..	75	13	25	17	20	17	21	6	16	1	14	—	50.6	50.6
Obsessional states	60	9	25	14	12	19	12	1	17	8	3	—	56.7	51.7
Depressive states	30	5	11	5	9	10	5	2	7	—	3	3	53.3	50.0
Sexual difficulties	30	6	16	4	4	9	13	—	3	2	3	—	73.3	73.3
Paranoid states	20	4	7	2	10	3	4	—	10	—	3	—	40.0	35.0
Delinquency ..	20	4	9	3	5	1	5	3	9	—	2	—	60.0	30.0
Schizoid states	15	3	7	4	3	2	1	2	9	—	1	—	53.3	20.0
Backwardness	15	3	4	6	4	1	5	—	7	—	2	—	33.3	40.0
Epilepsy ..	6	1.2	2	1	2	1	—	—	2	—	3	—	50.0	16.6
Alcoholism ..	5	1	1	1	1	2	1	1	1	—	—	—	60.0	60.0
Migraine ..	4	0.8	3	—	1	1	1	—	2	—	—	—	75.0	50.0
Total ..	500	114	214	87	85	140	135	26	115	19	56	9	—	—
Percentage	—	22.8	42.8	17.4	17.0	28.0	27.0	5.2	23.0	3.8	11.2	1.8	65.6	55.0

The term 'Relieved' is used throughout the tables to signify the two groups 'Much Improved' and 'Improved' considered together.

These figures do not differ materially from the comparable figures which apply to the 500 cases in which the follow-up has been complete (*Table I*). The vitiation of results by untraceable patients thus appears to be less serious than might at first be thought.

The conclusion to be drawn from *Table II* is that, as a result of psychotherapy, more than half of the 500 cases can be judged relieved three years after their discharge from treatment. Considering the complexity of the illnesses in question, and the severe disablement frequently present, this is by no means unsatisfactory; 65.6 per cent of the 500 patients are considered relieved on discharge, and after three years the number has dropped to 55 per cent, so that 10.6 per cent have relapsed during the follow-up period.

The justifiability of considering together the two groups 'much improved' and 'improved' under the term 'relieved' is based on the fact that during the three years after discharge a great deal of interchange takes place between these two groups, but only a negligible number of cases are promoted to them from the 'slightly improved' and 'not improved' groups. It is therefore clear that roughly the same individuals form the 'relieved' group, both on discharge and after three years. The number in the 'much improved' group actually rises during the follow-up period from 22.8 per cent to 28 per cent. After three years 5.3 per cent of 'improved' cases are promoted into the 'much improved' category, and 9.5 per cent of 'improved' cases relapse into the two lower categories. These changes account for the apparently large fall, from 42.8 per cent to 27 per cent, in the figures for 'improved' cases. The number in the 'slightly improved' group falls from 17.4 per cent to 5.2 per cent. This is almost entirely due to relapse, only a negligible number of these cases being promoted to the higher categories as a result of follow-up reports.

REFERENCES.—<sup>1</sup>*Jour. Amer. Med. Assoc.* 1933, ci, Nov. 18, 1612; <sup>2</sup>Kegan Paul, Trench, Trubner & Co. Ltd., 1934; <sup>3</sup>*Lancet*, 1935, i, April 6, 796; <sup>4</sup>*Brit. Med. Jour.* 1935, ii, July 13, 54.

## PULMONARY EMBOLISM.

Sir W. I. de C. Wheeler, F.R.C.S.I.

This calamity comes like a thief in the night and resembles the riddle of the sphinx. H. E. Robertson<sup>1</sup> gives a picturesque account of this tragedy. The usual age of the patient is thirty years or older. The weight is likely to be more than the average. The operation is abdominal, and the more serene the events during and following the operation, the more likelihood there is of venous thrombosis and embolism. There are no major complications such as peritonitis or pneumonia. Convalescence is peculiarly uneventful. Suddenly, almost always out of a clear sky, there is a strange restlessness, rapidly ensuing shock with substernal distress, air-hunger, and collapse—and death usually in two to fifteen minutes. Robertson might have mentioned the almost invariable desire to go to stool and the asking for the bed-pan. Thrombus formation is not always due to infection or injury to the vessel wall; it is simply stasis or stagnation of blood in particular situations. The maximal effect of this stasis is found during the rigid quietude of a patient after operation in the first week; the fatality occurs in the second week. If infection occurs giving rise to a rapid pulse and increased respiratory rate, the accident rarely happens. In Graves' disease operation is never complicated by embolism; the rapid heart is the factor of safety. The veins of the pelvis and the legs, usually the left, are the common sites of thrombosis.

Obviously the prophylaxis should be in the direction of movements of the patients from the time of operation. They should be directed to move freely in the bed, to practise the taking of deep inspirations, to get up and sit in a chair, etc., at the earliest possible moment, and if possible have massage.

*Thyroid extract*, as recommended by Walters some years ago, in 2-gr. doses daily, may have a good effect by raising the pulse-rate.

The reviewer has had no case of fatal pulmonary embolism since active and passive movements were adopted as a routine post-operative procedure whenever possible. The patients were allowed up (in uncomplicated cases) within a week of operation. Deep inspirations and expirations, brought about in recent years by the administration of *carbon dioxide gas* before the patient leaves the operation table, are encouraged so long as the patient remains in bed. The flow of blood from the pelvis and extremities is due principally to negative thoracic pressure during respiration combined with the muscular contractions of the lower limbs.

H. A. Gamble<sup>2</sup> recommends two practical measures for the prevention of pulmonary embolus. First is the employment of carbon dioxide and oxygen post-operatively, which was originally instituted as a preventive of post-operative pneumonia, but which we have come to believe serves an equally useful purpose as a measure for preventing the occurrence of phlebitis and pulmonary embolism, by the forcing of deep respiration at a period when all vital functions are at a low level. After the first twenty-four hours' employment of carbon dioxide and oxygen, routine deep breathing exercises are substituted. Secondly, an equally if not more important measure in promoting the flow of venous blood in the lower extremities is the maintenance of the muscle tone and contraction of the muscles of the legs. This is accomplished by the systematic daily use, beginning the first day post-operatively, of a device consisting of two bicycle pedals mounted upon a broad base which can be placed conveniently in the bed for exercising the lower limbs.

REFERENCES.—<sup>1</sup>*Amer. Jour. Surg.* 1934, Oct., 15; <sup>2</sup>*Ibid.* 1935, xxviii, April, 93.

**PYELITIS.** (See also KIDNEY; URETER; URINARY THERAPEUTICS.)

Ivor J. Davies, M.D., F.R.C.P.

D. M. Lyon<sup>1</sup> (Edinburgh) opened a discussion on *B. coli* infection at the Annual Meeting of the British Medical Association in 1934. Such infections are often mild and are perhaps rather lightly regarded for this reason. They may, however, be prolonged and produce chronic invalidism and even septicaemia. Energetic and early treatment is essential, and this contribution gives a good account of etiology and treatment. Constipation must be corrected and drastic purgatives must be avoided. Diarrhoea and other lesions of the bowel should be attended to. The so-called intestinal antiseptics are probably of little assistance, and calomel in non-purgative doses is probably as useful a drug as any, and sulphur may also be of service. High colon lavage may be employed, and an attempt be made to alter the intestinal flora by implanting *B. acidophilus* and by giving lactose. Whole-wheat bread, uncooked starches—such as oatmeal—and sour meal preparations have been proposed for the same purpose. Almost all writers agree that milk should be avoided during the acute stages of renal infections, and meat is usually restricted. Butter and eggs are also usually restricted. Autogenous vaccines may be helpful. In acute cases the patient must be kept in bed, and large quantities of fluid should be given, together with alkalis, and, perhaps, an antispasmodic, such as hyoscyamus. Barley water, fruit juices, and glucose drinks should be given up to 3 or 4 pints a day. The alkalis most commonly employed are potassium citrate and sodium bicarbonate up to 150 or even 300 gr. of each in the twenty-four hours. One or more doses may also be given during the night. These salts should be continued for several days after the temperature becomes normal, but they are apt to cause depression if kept up too long. When satisfactory administration of alkalis has not been successful in relieving the

condition, the effect of acidifying the urine should be tried. Alternate periods of 7 to 10 days on alkali, and then on acid, may prove more successful than the continued use of either. The production of an acid urine is a necessary preliminary to the use of hexamine. Acid sodium phosphate is usually employed for this purpose. Dyes of the pyridine series have recently been employed as urinary antiseptics, and can be used without regard to the reaction of the urine. Euflavine is probably the best of the group, the urine being made alkaline with sodium bicarbonate. The ketogenic diet is unappetizing and even nauseating, and it is difficult to get patients to co-operate thoroughly for any length of time. It is unlikely that this method of treatment will be much used except in the most resistant cases.

Cuthbert Dukes<sup>2</sup> (London) discussed the conditions predisposing to *B. coli* infection after post-operative retention of urine following the operation of excision of the rectum. Such infections are much commoner in women, and the risk increases steadily with advancing years in both sexes. The patient's general state of health is an important factor in the incidence of urinary infection after post-operative retention. Early cases are thus in a much better state of health at the time of operation than late cases. These factors predispose to infection because of their influence on the functional activity of the bladder, and exemplify a principle, familiar in urinary pathology, that urinary infections are often dependent on defective function of the urinary organs.

T. P. Sharkey and H. F. Root<sup>3</sup> (Boston) made a clinical and pathological study of the incidence of urinary tract infection in 196 diabetic cases; 18 per cent revealed at autopsy evidence of urinary tract infection, which could be divided into three main groups: hæmatogenous, ascending, and unknown. Seventy per cent of the cases fell into the hæmatogenous group, in which infection of the urinary tract was secondary to infection elsewhere in the body. Ascending infection was secondary to obstructive lesions in the urinary tract. In a small group of patients in whom severe renal infection was present, it was impossible to ascertain the etiological factors. Such cases are apt to be latent, as urinary symptoms are frequently absent. Catheterization is sometimes responsible for the development of urinary tract infection. The tendency of the urinary tract infection in diabetic patients to recurrence and chronicity is common. The occurrence of unexplained fever in diabetic patients should prompt an investigation of the possibility of urinary tract infection.

REFERENCES.—<sup>1</sup>*Brit. Med. Jour.* 1934, ii, Sept. 8, 454; <sup>2</sup>*Ibid.*, 458; <sup>3</sup>*Jour. Amer. Med. Assoc.* 1935, civ, June 22, 2231.

### **PYLORIC STENOSIS, CONGENITAL.** John Fraser, Ch.M., F.R.C.S.Ed.

There are some who believe that the incidence of this disease is increasing. Certain statistics collected by C. Rammstedt<sup>1</sup> by means of questionnaires sent out to a number of German clinics indicate an increase of cases from 1824 in the period 1919-28 to 2432 in the period 1929-33, but it is possible that a certain percentage of what appears to be a remarkable increase is attributable to more accurate diagnosis. If it is true that the incidence of the disease is increasing, a most interesting problem is opened up, and many questions would come under consideration. Is it in any way attributable to maternal influences, and is it possible that the stress and demands of modern civilization are exerted through the mother upon the autonomic nervous system of her offspring?

The pathology of the local error is now fully recognized; it appears to consist in a hypertrophy of both the circular and the longitudinal muscular fibres of the pyloric portion of the stomach up to but not including the circular fibres of the pyloric sphincter. We are therefore not in agreement with the description which W. E. M. Wardill<sup>2</sup> gives, that "the essential abnormality consists

of an immense increase of the circular musculature of the pylorus and pyloric canal". The exact distribution of the muscular hypertrophy has recently been worked out with great accuracy by J. Douglas,<sup>3</sup> and he has shown that without exception the circular fibres of the true sphincter remain unaffected. The exact factor which induces the hypertrophy remains obscure, but the knowledge which we possess seems to indicate that an undue degree of sympathetic control is the real error. The sympathetic innervation is concerned with the filling of a hollow muscular organ, and the filling process is achieved by a relaxation of the smooth muscle of the wall and a contraction of the non-striped muscle of the sphincter; the parasympathetic distribution, on the other hand, the emptying mechanism, acts in relation to the contraction of the smooth muscle of the wall and coincident relaxation of the sphincters. When congenital hypertrophy of the pylorus results the sympathetic or filling influence outweighs the parasympathetic or emptying impulse, and the efforts of the latter to adjust the balance result in hypertrophy of the muscular tissue. Such is the conception which the consensus of opinion accepts at the present time, and the appreciation brings congenital stenosis of the pylorus into line with such conditions as Hirschsprung's disease and congenital hypertrophy of the urinary bladder. A powerful argument in support of the above explanation is found in the benefit which has resulted in Hirschsprung's disease after extirpation of the sympathetics as achieved by the operation of ganglionectomy.

The treatment of congenital stenosis of the pylorus is passing to a large extent into the hands of the surgeon. There are some clinicians, however, such as Ibrahim, who continue to employ medical means throughout. His investigation of cases reported a 6 per cent mortality in 81 cases treated in the period 1929-33, but in this country operation is regarded as offering the best prospects of improvement within the shortest period of time.

The mortality associated with operation has recently been the subject of discussion, and in the MEDICAL ANNUAL, 1935 (p. 346), reference was made to the striking difference which there is in the statistics as reported from various centres. It is therefore interesting to record the figures which Rammstedt gives. The results he mentions are not limited to his own clinics; they were obtained by questionnaires submitted to a number of pediatric centres in Germany, and they have the additional value of affording comparison between the statistics of 1929 and 1933. A summary of the results is as follows. While the number of operations showed a relatively small increase from 27 to 30 per cent, the total number of deaths decreased from 18 to 10.7 per cent; but the real interest of Rammstedt's figures is concerned with what has sometimes been called the 'Düsseldorf experiment', the gist of which was that prior to 1928 92 cases were treated by purely conservative means with a mortality of 18.8 per cent, while since 1928 110 cases have been dealt with surgically, and, as we read the record, no discrimination has been exercised; the group has been regarded as a series, and each case in this series has been submitted to operation after suitable preparation; the mortality was 3.6 per cent.

It seems that this must be regarded as a most significant record, and on the face of it the superiority of surgical treatment seems to be established, and it only remains for those whose operation results are less satisfactory to do what they can to reach the high standard Rammstedt has achieved. This author insists upon the importance of careful pre-operative treatment, and the points he mentions are infusion of glucose and sodium chloride, gastric lavage with sodium chloride or tea, and the prevention of chill. He criticizes local anaesthesia as being inadequate and apt to induce increased shock, and he uses ether anaesthesia for preference, but in the presence of lung infection

he does not hesitate to employ chloroform. It is remarkable that he makes no mention of gas-and-oxygen anaesthesia. The details of post-operative care are left to the physician.

Wardill<sup>2</sup> gives an interesting account of his experiences in 100 cases. He advises operation on all cases within twenty-four to forty-eight hours of the establishment of the diagnosis, with the exception of those who have attained the age of twelve weeks or more, for the reason that a child surviving to this age has a prospect of 'spontaneous recovery'. He stresses the importance of maintaining breast-feeding if this is at all possible, and we are in full agreement with the importance of this recommendation. A further point brought out by him which is not always appreciated is the liability of these children to die from septicaemia incurred in the hospital ward, and frequently without any evidence of the avenue by which the infection has entered. Wardill's mortality figure in 123 cases was 23.5 per cent.

In a series of 50 cases treated by operation Kehl and Thomann<sup>4</sup> record a death-rate of 4 per cent, and they make the statement that they see no reason why operative mortality should not be eliminated entirely if sufficient attention is paid to the details of pre-operative and post-operative care. If these figures are to be relied upon (and there appears to be no reason to doubt their accuracy) we must acknowledge that British statistics reveal a less satisfactory state of affairs. Edinburgh statistics<sup>5</sup> reported a mortality of 24.8 per cent, while the Newcastle figures to which allusion has already been made show a mortality of 23.5 per cent. On the other hand, Hipsley and Tait,<sup>6</sup> in a letter to the *British Medical Journal*, announced a 4 per cent mortality in 120 cases. And yet it is difficult to isolate the factor which would explain the discrepancy; there appears to be no outstanding difference in technique, the pre-operative and post-operative procedure appears to be very similar, and ultimately one is driven to the conclusion that early diagnosis and the adoption of operation as soon as the diagnosis has been made must play some part in explaining the satisfactory results which certain centres appear to obtain.

REFERENCES.—<sup>1</sup>*Ergebn. d. Chir.* 1934, xxvii, 54; <sup>2</sup>*Newcastle Med. Jour.* 1935, x.v, April, 83; <sup>3</sup>M.D. Thesis, University of Edinburgh, 1935, July; <sup>4</sup>*Zentralb. f. Chir.* 1935, lxii, April 27, 963; <sup>5</sup>*Brit. Med. Jour.* 1934, i, June 30, 1154; <sup>6</sup>*Ibid.* Nov. 3.

**RADIOTHERAPY.** (See CANCER, RADIOTHERAPY OF; X-RAY AND RADIUM THERAPY; ETC., ETC.)

**RECTUM, CANCER OF.** (See also CANCER, RADIOTHERAPY OF; COLON, SURGERY OF.) J. P. Lockhart-Mummery, F.R.C.S.

**Operative Treatment of Cancer of the Rectum.**—A number of papers have appeared during the year on this subject, notably by Fred Rankin,<sup>1</sup> W. B. Gabriel,<sup>2</sup> F. Voelcke,<sup>3</sup> and T. S. Raiford.<sup>4</sup> There still seems to be considerable divergence of procedure among surgeons as regards the method employed for excising the rectum, some preferring a high excision involving the opening of the abdomen and the perineum at the same time, while others prefer to remove the rectum by the perineal or sacral route when possible. A general study of the mortality figures and recurrence rates appears to show that in growths involving the rectum only, the best results are obtained by a sacral or perineal excision with previous colostomy. There is practically universal agreement on the advisability of planning the operation as a two-stage rather than as a single-stage procedure, and at the first stage doing a colostomy or decompression operation only. This appears to render the subsequent operation of removal very much safer, the truth being that in practically all cases

of cancer of the rectum, whether high or low, there is a certain degree of obstruction always present, which seriously militates against a satisfactory result if the operation is performed in one stage.

There is a considerable difference in practice as regards the time allowed to elapse between the colostomy and the excision, some surgeons preferring to wait only a week, whilst others wait two to three weeks. There can be no absolute rule, and it depends largely upon the type of patient and his general condition. It is always better to leave a long interval unless the surgeon is quite satisfied that the patient's general condition cannot be further improved. There is a general agreement that a preliminary decompression operation is of the greatest value in lowering the general mortality from these operations.

Several surgeons prefer to perform the operation with an electric coagulation knife, and claim advantages for this procedure. It is a little difficult to say what advantages can be obtained in the ordinary straightforward case, where the surgeon is able to keep well clear of all cancerous tissue, since there cannot then be any fear of the implantation of cancer cells into the healthy tissues, and healing must inevitably be slower after electric coagulation than where the knife is used. Although a drier field of operation is obtainable and less time is spent over tying vessels, the risk of secondary hæmorrhage is increased where electric coagulation is used. In those cases where the growth is very extensive, and the operation is undertaken as a forlorn hope, or merely with the object of alleviating the patient's symptoms rather than completely eradicating the disease, diathermy or the coagulation knife is better, as it is almost impossible to avoid going through cancerous tissue. (M. Thorek.<sup>5</sup>)

Frank C. Yeomans<sup>6</sup> gives a reasoned review of all the present methods of treating cancer of the rectum by operation. He gives the following methods as being carried out by surgeons at the present day : (1) One-stage abdomino-perineal operation ; (2) Two-stage abdomino-perineal operation ; (3) Two-stage perineal excision ; (4) Posterior resection ; (5) Perineal amputation. It is his opinion that the two-stage perineal excision for tumours of the rectum proper justly merits the popularity accorded it, especially by British surgeons. At the first stage the abdomen is explored and a loop colostomy established. About two weeks later, during which time the distal segment has been irrigated and the general condition of the patient improved, the distal segment is removed through the perineum at a safe distance above the tumour and the proximal end inverted by a double row of sutures.

**Radium Treatment of Cancer of the Rectum and Anus.**—Considerable difference of opinion is expressed with regard to the value of radium and X rays, either before or after operation. The Mayo Clinic use a combination of operation, radium, and rays, but do not appear to have reached any standard method.

A discussion on this subject took place at the Royal Society of Medicine.<sup>7</sup> Sir Charles Gordon-Watson in opening the discussion gave the following indications for the employment of radium in treating cancer of the rectum : (1) In operable cases when operation is resolutely refused ; (2) In selected inoperable cases when the growth is not too large and access is reasonably easy ; (3) In selected cases to insert radon seeds at the time of the colostomy into the region of the retro-rectal glands prior to excision ; (4) In cases of limited perineal recurrence. He quoted a number of cases where patients treated by radium had survived long periods up to seven years. Dr. Cl. Regaud, of Paris, stated he had abandoned the use of radium for cancer of the rectum except in a few carefully selected cases where biopsy appeared to show a radio-sensitive form of tumour. He advocated the use of radium in the treatment of epithelioma of the anus, associated with radical operation upon the inguinal glands.



J. P. Lockhart-Mummery and Stanford Cade agreed that radium should be used in selected cases of cancer of the rectum and that with improved technique good results are obtainable.

James Duffy<sup>8</sup> discusses the value of radiation in the treatment of rectal cancer. He concludes that for external irradiation—that is, radiation applied through the intact skin—better results are obtained by radium applied in applicators than by the use of X-ray tubes. He finds the greatest objection is the large number of visits that it is necessary for the patient to make to the clinic, especially as many of the patients are in a poor and debilitated state of health. Like other authorities, he mentions a few very good results, where large inoperable tumours have disappeared for periods as long as four years; but the statistics of all cases leave much to be desired.

G. E. Binkley<sup>9</sup> discusses the treatment of carcinoma of the rectum by the implantation of radon seeds. A large proportion of the cases treated were inoperable from a surgical point of view. The technique employed is to use external irradiation with radium previous to implantation of the seeds. These are generally implanted through a proctoscope, the upper area being first of all implanted with seeds in rows 1 cm. apart. The instrument is then partially withdrawn and another row of seeds inserted in the same manner, this procedure being repeated until the whole tumour is uniformly implanted. The seeds used are 4 to 5 mm. long, 0.75 mm. in diameter with a three-tenths thickness of gold, and equal to  $1\frac{1}{2}$  to 3 millicuries each. He considers that treatment with radon seeds is chiefly valuable as a palliative method of holding the growth in check rather than as an actual cure. He rightly points out the danger of producing considerable reaction, which may be difficult to overcome, and warns against over-dosage. He considers that much of the adverse opinion towards radiation therapy in rectal cancer has been created by the intensive treatment of unsuitable cases. The best results are often obtained by repeating the procedure after a reasonable interval, either once or twice. He still considers that operative removal is the most suitable method of treatment where available and where the patient's physique is sufficiently satisfactory, but when the patient is a bad risk he believes that radium is the best method of treating even operable cases. A review of his cases shows 24 patients prior to 1933 who are clinically free from cancer. Out of 238 cases treated between 1926 and 1930, only 9 lived over three years, and 1 for four years; about half the cases showed marked palliation of symptoms.

REFERENCES.—<sup>1</sup>*Proc. Roy. Soc. Med.* 1934, xxvii, Oct., 1721; <sup>2</sup>*Lancet*, 1934, ii, July 14, 69; <sup>3</sup>*Tag. d. deut. Ges. f. Chir.* Berlin, 1934; <sup>4</sup>*Ann. of Surg.* 1935, ci, April, 1042; <sup>5</sup>*Med. Record*, 1934, xli, Aug 15, 173; <sup>6</sup>*Ann. of Surg.* 1935, cii, July, 68; <sup>7</sup>*Proc. Roy. Soc. Med.* 1935, xxviii, July, 1251; <sup>8</sup>*Ann. of Surg.* 1935, cii, July, 77; <sup>9</sup>*Ibid.* 72.

## RECTUM, SURGERY OF, MISCELLANEOUS. (See also ANAL; HÆMORRHOIDS.)

J. P. Lockhart-Mummery, F.R.C.S.

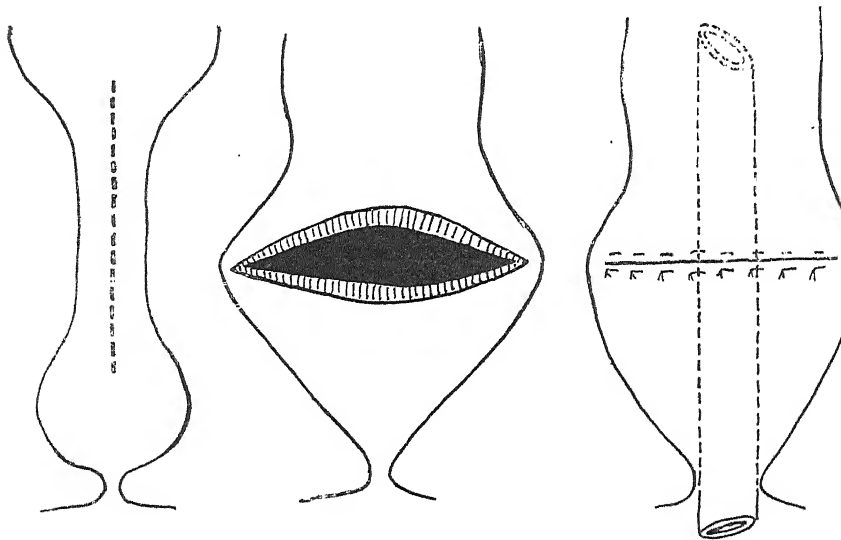
**The Relationship between Adenomata and Cancer of the Large Bowel.**—J. P. Lockhart-Mummery<sup>1</sup> has traced the history of 50 cases of simple adenomata of the rectum over a period of years. Most of the cases have been examined sigmoidoscopically at regular intervals after the original tumour had been removed. Out of a total of 50 cases there were 25 in which another tumour developed in some other part of the bowel, and 12 where a malignant tumour subsequently occurred. In 13 cases other adenomata developed more than once in different sites. Thus one patient had no fewer than 8 adenomata in different parts of the rectum during 15 years, while another had 6 in 14 years. One had 7 adenomata in 6 years and another 9 in 8 years. Some adenomata grow to a very large size without ever becoming malignant, while some quite small tumours become malignant early. These cases seem to prove that an

adenoma of the rectum or colon is not an innocent tumour in any sense, and that in fact adenomata are merely a stage in the development of malignant tumours and should be so treated.

J. C. Mottram<sup>2</sup> describes the results of a study of the rate of growth of tar warts in mice, and postulates the possibility that the growth-rate decides the question of innocency or malignancy. Where the growth-rate is slow the tissues are able to set up a protective reaction against the process, but when the growth-rate is fast this protective reaction breaks down and invasion of the other tissues takes place.

From a practical point of view local removal of the tumour would appear to be sufficient, if the patient is watched at four-monthly intervals during the next five to ten years so that any fresh tumours can be removed at once before they have an opportunity of becoming malignant. But unless the patient is kept under observation in this way, the development of other tumours is most likely to occur unobserved. The frequency of such a happening appears to be about 50 per cent, and considerable danger exists of malignancy supervening.

**The Operative Treatment of Stricture of the Rectum.**—J. P. Lockhart-Mummery and O. V. Lloyd-Davies<sup>3</sup> divide stricture of the rectum into two variations: diaphragm strictures and tunnel strictures (*Plates LXIII, LXIV*).



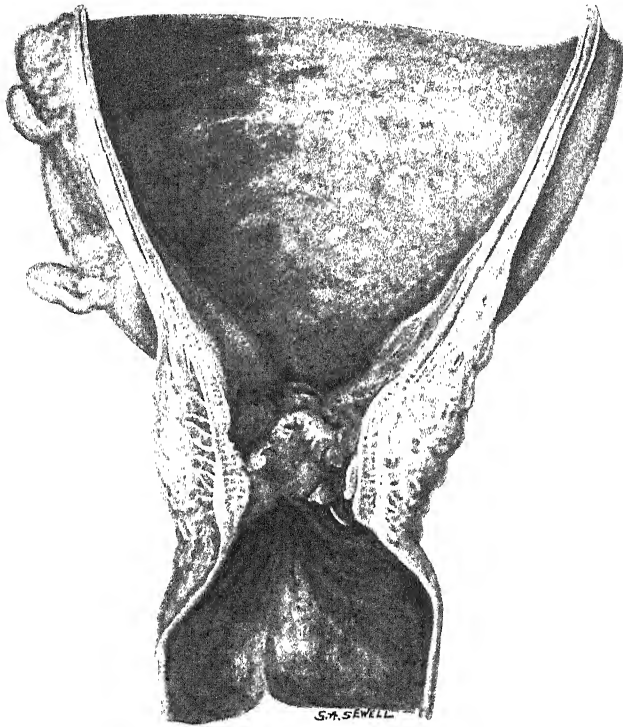
*Fig. 57.*—Diagram showing steps of the operation or dealing with stricture of the rectum.

They advise that the former should be treated by internal proctotomy. The stricture is nicked in several places posteriorly and laterally, and then dilated up to the required size with metal dilators. The rectum is then thoroughly washed out with a suitable antiseptic and half a tube of vaseline is squeezed into the bowel. A large vulcanite tube, of the size of the largest dilator, is then inserted and kept in place for forty-eight hours. After this the stricture is kept dilated at intervals for six months. This method is quite satisfactory for strictures below the peritoneal reflection. The authors point out the danger of attempting to deal with high-lying strictures in this way, and that resection or direct surgery is much safer.

PLATE LXIII

FIBROUS STRICTURE OF THE RECTUM

(J. P. LOCKHART-MUMMEY and O. V. LLOYD-DAVIES)



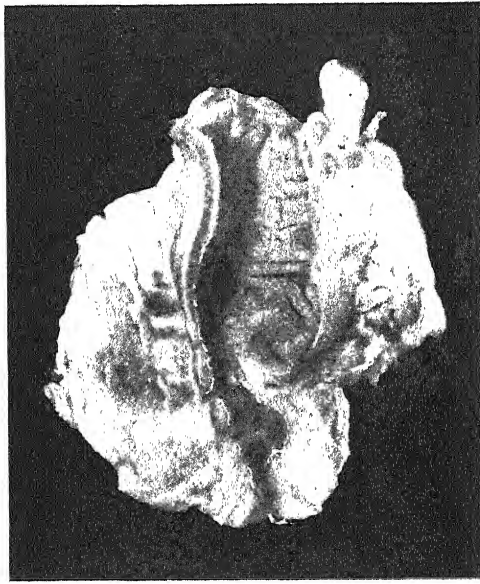
Drawing of a specimen of fibrous stricture of the rectum in the Royal College of Surgeons Museum, showing dense fibrosis of the perirectal tissues.

*Plates LXIII, LXIV by kind permission of the  
'British Journal of Surgery'*

*PLATE LXIV*

FIBROUS STRICTURE OF THE RECTUM—*continued*

(J. P. LOCKHART-MUMMERY and O. V. LLOYD-DAVIES)



Photograph of a specimen of fibrous stricture of the rectum. The patient was a woman aged 40. The strictured portion of the rectum was resected and the rectum restored after a temporary colostomy. She has remained well since.

The tunnel type of stricture cannot be dealt with by internal proctotomy or dilatation, and hitherto this type has been treated by excising the rectum or doing a resection after a temporary colostomy. Failing this, the establishment of a permanent colostomy was the only possible procedure. The authors describe a new method of dealing with these tunnel strictures which has the advantage of being easier and safer than a resection, and in suitable cases gives a better result. After a preliminary colostomy and getting all the ulceration cleared up, the operation is performed as follows: An incision is made from the base of the coccyx to the posterior margin of the anus. The coccyx is removed and the post-rectal fascia divided. The rectum is then freely mobilized by stripping it from the pelvic wall on each side and drawing it up into the wound. A longitudinal incision is then made through the whole of the strictured area into the rectum, the incision extending into healthy bowel both above and below the narrowed portion. The wound in the rectum is now sown up in the opposite direction (transversely) with independent stitches and covered with a second row of Lembert sutures, the fascia being stitched over the junction, and a large drainage tube is inserted well above the wound in the rectum and left in for several days (*Fig. 57*). In the case reported the wound healed well, and four months later the colostomy was closed intraperitoneally. A year afterwards the patient's rectum showed a normal lumen.

**Pre-operative Treatment in Operations upon the Colon and Rectum.**

C. F. Dixon and James T. Priestley<sup>4</sup> stress the following points. The patient should be blood-grouped so that a transfusion can if necessary be performed quickly, and should be kept in bed from three to five days prior to operation so as to have complete rest and allow careful preparation. A high carbohydrate diet is recommended with a view to storing up the carbohydrates for the period immediately after the operation. Stress is also laid on the importance of seeing the patient is not dehydrated, and that there is a generous supply of fluids. A vaccine of streptococci and *B. coli* should be injected three days before operation as a routine. Warm enemas are given daily two days before operation, or a physiological salt solution. The authors also stress the importance of performing the operation in stages whenever possible rather than trying to do everything at one operation. The extreme danger of operating on patients who have not been previously decompressed is insisted upon. They look upon temporary caecostomy as a life-saving procedure in most cases of colon resection, and in all cases where there is acute obstruction.

These are the general views of most surgeons at the present time. There can be no doubt that a great improvement in the results of colon surgery has resulted from planning the operation in stages, so as to avoid doing any extensive or dangerous procedure upon an obstructed or partially obstructed patient, and in paying great attention to the careful preparation of the patient prior to operation. Many such patients show evidence of being short of chlorides, and when this is so chloride solution should be run into the veins continuously until all evidence of chloride deficiency has disappeared. The chloride solution should be run into the veins slowly for twenty-four hours or more until the urine, when tested with silver nitrate, shows a good heavy cloud of precipitate. This is often a life-saving method in bad cases.

**Diothane in Rectal Anæsthesia.**—F. C. Smith<sup>5</sup> discusses the use of diothane as a local anæsthetic in operations upon the rectum and neighbourhood. He states that this drug, which is a derivative of phenyl urethane, is relatively stable to heat and will stand sterilization. It must be kept in alkali-free containers, and it cannot be put into ordinary glass vessels; special ones of pyrex glass must be used, or the solution prepared freshly on each occasion. He finds that diothane is three times as active as procaine and has about the same

toxicity in suitable dosage. It is very slowly diffusible in the tissues and should be injected ten minutes to a quarter of an hour before the full effect is obtained. It gives a very satisfactory anaesthesia, and owing to its slow diffusibility rate it can be injected at some little distance from the anal nerve areas. He advises the use of diothane for obtaining local anaesthesia for rectal operations, and also to put into the operative field after operations in order to prevent after-pain.

REFERENCES.—<sup>1</sup>*Lancet*, 1935, i, May 18, 1149; <sup>2</sup>*Amer. Jour. Cancer*, 1934, xxii, 801; <sup>3</sup>*Brit. Jour. Surg.* 1935, xxiii, July, 19; <sup>4</sup>*Surg. Gynecol. and Obst.*, 1933, lvii, Aug. 206; <sup>5</sup>*Med. Record*, 1935, cxli, June 19, 581.

### RELAPSING FEVER.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

Relapsing fever is reported by A. Sachs<sup>1</sup> to be more common in Chitral than was previously thought to be the case, for fifty cases have occurred in 1932 and 1933, many of which appear to have been contracted on the journey up from the Punjab. The *S. recurrentis* has been identified in some of the cases, which ran a typical course of that infection with at least one relapse in 64 per cent, while others had five and six pyrexial attacks. No death occurred among 106 cases in all, and the incubation period is believed to have varied between six and fifteen days. Lice do not appear to have been the usual carrier of the infection, as 84 of 102 cases were stated to be free from lice; the tick, *A. persicus*, is met with in this region; but all attempts to transmit the disease by either insect have so far failed, and it is believed that both the louse and tick types are present.

J. Cunningham and A. G. L. Fraser<sup>2</sup> report on the serology of relapsing fever in human beings. They conclude that the types of *Sp. carteri* of louse-borne relapsing fever of North and South India are identical and belong to Types A and B. The Persian tick-borne variety also occurs on the North-west Frontier of India, and the louse-borne cases of that area belong to Type C.

REFERENCES.—<sup>1</sup>*Jour. R.A.M.C.*, 1934, lxiii, Oct., 217; <sup>2</sup>*Ind. Jour. Med. Research*, 1935, xxii, April, 595.

### RENAL DISEASES. (See also KIDNEY.) H. Letheby Tidy, M.D., F.R.C.P.

**Renal Efficiency Tests.**—Tests for renal function may be divided into two groups: (1) Those which estimate the power of the kidney to concentrate the urine; and (2) Those which measure its power to eliminate the renal excretory products.

In the first group falls particularly the *specific gravity*. A kidney near the point of failure secretes a urine throughout the twenty-four hours with a specific gravity of approximately 1012, but observations of the specific gravity cannot be used to give a quantitative measure of the degree of partial inefficiency. Of all tests at present available, it is generally agreed that *van Slyke's clearance test*, and its modifications, give the most reliable quantitative measure of renal efficiency. Many of the investigations now being published accept the clearance test as the standard and compare other methods with it.

H. O. Mosenthal and M. Bruger<sup>1</sup> (New York) have carried out a further study of the *ratio of urea nitrogen to the non-protein nitrogen of the blood* as an index of the amount of effective renal tissue. It has long been known that the ratio falls as renal deficiency develops, and the test has the advantage that it may be carried out on one specimen of blood and does not require prolonged observation of the patient or collection of urine. They use the formula:—

$$\frac{100 \times \text{urea nitrogen}}{\text{non-protein nitrogen}}$$

The resulting figure is referred to as the 'urea ratio'. In a series of 200 normal

persons 70 per cent of the ratios were between 30 and 40, while in only one was it lower than 20, and in only two was it higher than 40. They consider urea ratios of 44 or less as normal. They estimated the urea ratio in various types of nephritis and compared the results with those obtained by van Slyke's urea-clearance test. They draw the following conclusion from this comparison : (1) With maximal impairment of renal function the index is 80 or higher ; (2) With improvement in renal function there is a drop in the ratio and with progressive impairment of function there is a rise in the ratio ; (3) The determination of the urea ratio at intervals measures progressive changes in renal deficiency and affords a reliable index of renal function. The authors refer to the fact that the non-protein nitrogen may vary considerably as the result of alterations in diet, but they do not consider that this affects the results of their conclusions. [Some of the tables, however, suggest that alterations in diet may produce considerable changes in the urea ratio.—H. L. T.]

E. M. MacKay and D. A. Ryland<sup>2</sup> (San Francisco) have produced a further study of the *phenolsulphonephthalein* test of renal function with a careful examination of its value as compared with the Addis modification of van Slyke's urea-clearance test. They collect the samples of urine at intervals of one and two hours after the intravenous injection of the dye. From a statistical analysis of the results they draw the conclusion that the phenol-sulphonephthalein test is superior to the urea-clearance test as a measure of the amount of functioning renal tissue. [This test has been largely used in America since its introduction by Rowntree and Geraghty in 1910. It has the advantage that the dye is injected intravenously and thus reaches the blood-stream instantaneously. Further, the percentage of excretion of phenolphthalein is compared with a normal base line of zero, as the dye is not a normal constituent of urine. The test, however, has been considered to be somewhat unreliable. A comparison with van Slyke's test was referred to in the MEDICAL ANNUAL of 1935 (p. 352).—H. L. T.]

E. J. Stieglitz and A. A. Knight<sup>3</sup> (Chicago) present a preliminary report on *sodium ferrocyanide* as a clinical test of glomerular efficiency. They claim that the ferrocyanide salts have the unique characteristic that they are excreted solely by the glomeruli. This claim is based on the work of Marshall showing that ferrocyanide is not eliminated in the renal secretion of aglomerular fish, and the demonstration by Gersh and Stieglitz that in mammals ferrocyanide salts are eliminated by the glomeruli. The test is performed by the intravenous injection of sodium ferrocyanide. Sterilization is difficult as the substance is decomposed by heat, but it is claimed that no evidence of any toxicity has been observed. The amount excreted is measured by titration with a quantitative copper sulphate solution. The method of the test follows the lines of the phenolsulphonephthalein test. The results are recorded in a certain number of cases of nephritis and are compared with the phenolsulphonephthalein test. It is claimed that ferrocyanide is more accurate and sensitive and records deficiencies of renal secretion in cases of hypertensive arterial disease in which there is little change in the phenolsulphonephthalein elimination.

J. W. Macy<sup>4</sup> (Rochester, Minn.) has investigated the *inorganic sulphate clearance* in renal diseases. The previous work of Hayman and Johnston has shown that the concentration of inorganic sulphate in the blood is often elevated before the urea. The author estimated the inorganic sulphate in the serum and in the urine on the same lines as the urea-clearance test. His main conclusions are as follows : (1) When a person is following a regimen of fasting the excretion of inorganic sulphate is fairly constant throughout the day, whereas when he is receiving a normal diet there is considerable variation. (2) Inorganic sulphate is concentrated less in the urine than is either urea or creatinine, and

the clearance of sulphate tends to maintain a more constant level than that of either of the other two substances. (3) With definite renal insufficiency the sulphate clearance is reduced in a great majority of instances, although in some cases it is normal when other tests indicate impaired substance. (4) The sulphate clearance in six cases was normal in the presence of an elevated value for serum sulphate. The explanation of this is not clear. (5) In certain cases of definite or suspected renal disease the sulphate clearance indicated impaired renal function when all of the other tests gave figures within normal limits.

**Nephrosis.**—R. B. Hawes and E. C. Vardy<sup>5</sup> (Singapore) publish an important study of nephrosis under the title, "Some Observations on the Etiology and Effect of Alkalis on the Nephrotic Syndrome." Nephrosis is common among the poorer classes of the Asiatic population in Singapore, in whom poor food, unbalanced diet, and even semi-starvation are usually present. The authors consider that nephrosis is not connected with ankylostomiasis or malaria and is easily distinguished from beri-beri and starvation oedema. Their work is a continuation of that of others on the effects of alkalis and alkaline diet in nephritis and nephrosis, but these authors find that the alkaline mixture of sodium and potassium salts is often ineffective, and uniform results were obtained only with potassium salts alone. No toxic symptoms were observed except in those cases which showed red blood-cells in the urine and which were classified as nephroso-nephritis, and in these headaches and increasing blood-pressure might result. The patients were placed on a basic alkaline diet and were given potassium bicarbonate and potassium citrate, 30 gr. of each, at such intervals as rendered the urine alkaline within forty-eight hours. They found that three beneficial results emerged: (1) Diminution of the oedema; (2) Lowering of the hypercholesterolaemia; (3) Some control of the albumin output in the urine. These results were obtained while the patients were on the alkaline treatment, and relapsed when treatment was changed to an acid diet or sodium salts were given instead of or together with potassium salts. With regard to the albumin, the tables show that the patients on admission were uniformly passing large amounts of albumin, and that on the alkaline diet these amounts greatly diminished and sometimes almost entirely disappeared. The authors note that the albumin passed is very variable in amount and it might be absent one day and on the next day be definitely present. They also noted that in spite of all treatment certain cases gradually drifted into a nephroso-nephritic or even a nephritic syndrome. These difficulties would naturally be expected, and in spite of them the results of these authors demand careful consideration.

D. M. Lyon and D. M. Dunlop<sup>6</sup> (Edinburgh) publish the life-histories together with various analyses of two patients exhibiting the nephrotic syndrome. Both of these patients exhibited at the beginning of their illness, and for many months afterwards, all the criteria of true nephrosis, and both eventually died with small contracted kidneys and with all the clinical, biochemical, and pathological signs associated with the uremia of chronic nephritis.

J. H. Barach and D. Martin Boyd<sup>7</sup> (Pittsburgh) record two cases of nephrosis treated with *acacia*. They claim that intravenous injection of *acacia* raises the colloidal osmotic pressure of the blood plasma towards the normal and thus leads to diminution of oedema. They use a 30 per cent solution of *acacia* with 4.5 per cent sodium chloride solution. This *acacia* solution is diluted with normal saline to a total volume of 500 c.c. and injected slowly. They treated two cases of chronic lipid nephrosis, one a young woman aged 20 years, and the other a boy aged 4 years. Neither patient showed evidences of improvement until *acacia* was given intravenously. One case received eleven injections, totalling 295 grm. of *acacia*, the other required only one injection to start the diuresis and bring about a clinical recovery. In both patients there was a



striking diuresis following the acacia injection. [It must be noted that other observers have seen serious reactions following injections of acacia.—H. L. T.]

**Nephritis.**—F. D. Murphy, J. Grill, and G. F. Moxon<sup>8</sup> (Milwaukee) publish a study of 94 cases of *acute diffuse glomerular nephritis* which had been under observation in hospital between the years 1924 and 1934. The general lines of their investigations are similar to those of other previous workers, but constitute a valuable contribution. They pay special attention to the now generally accepted importance of a septic focus as the cause of the acute attack, and further they accept the view that chronic glomerular nephritis is the sequel of an acute attack which may be of such mildness as to be overlooked. Of their 94 cases they find recovery in 50 per cent, death in 28 per cent, and chronic nephritis in approximately 22 per cent. [They do not distinguish between acute diffuse glomerular nephritis and acute focal glomerular nephritis or essential hæmaturia. Many authorities will agree with them in this view.—H. L. T.] In their series scarlet fever is of little importance, but they attribute great importance to lesser infections of the upper air-passages, particularly the common cold. They attribute 10 per cent of the cases to attacks of pneumonia, and stress this as a factor in the development of chronic nephritis. They emphasize the occurrence of a silent stage during which symptoms are unobservable but which slowly drifts into a progressive chronic nephritis. As a test of this stage they consider that the urea-clearance test and the sedimentation rate are of importance. A rapid sedimentation rate is a warning signal that the renal lesion is active and progressive, but a single determination may lead to false impressions.

*The Relation of Septic Foci to Nephritis.*—The connection between certain renal lesions and infection of the tonsils and upper respiratory passages is now universally accepted, and many statistics are in existence showing the frequency of such infections in series of cases of nephritis. But there is surprisingly little information available as to the frequency of renal damage in series of cases of tonsillitis and similar infection.

O. L. V. S. de Wesselow, H. K. Goadby, and D. C. L. Derry<sup>9</sup> (London) have investigated the renal manifestations in a series of 354 cases of tonsillitis seen at St. Thomas's Hospital between July, 1932, and July, 1933. The patients were seen usually on the third day of the disease, and the urine was examined on the fourth, eleventh, and eighteenth days of the infection. Cultures of the throat were taken, and in those cases in which the plate showed an almost pure culture of hæmolytic streptococci the case was classified as indicating a hæmolytic streptococcal infection. Of these 354 patients, 224 were ten years of age or under, 101 were 11 to 20 years of age, and 29 were above 20 years of age. At the first examination 37 per cent showed albumin, and in 51 (14.4 per cent) more than a faint trace was present. From the urinary changes it is probable that focal nephritis was present in 10 per cent. Of these 35 cases, albuminuria was still present in 7 only at the last examination. No correlation could be found between a predominance of hæmolytic streptococci in the throat swab and this early urinary lesion, the percentage of positive cultures in this group being almost the same as for the whole series of 354 patients. In 57 other cases albuminuria was first found at the third or fourth attendance, viz., 16 per cent. In 22 of these patients (6.2 per cent) more than a trace of albumin was present. In 3 cases evidence of diffuse glomerulo-nephritis was found, and of these 2 cleared rapidly under observation. Of the remaining 19 cases of late albuminuria, 10 are known to have cleared subsequently. In these cases of late albuminuria the percentage of heavy hæmolytic streptococcal infection was somewhat, though not greatly, above that of the whole series. No correlation could be found between the incidence of albuminuria in the summer or winter.

*Alkalosis and Nephritis.*—In view of the large doses of alkalis which are now frequently given in nephritis, it is of some interest to consider the condition of the kidneys under modern alkaline treatment for peptic ulcer. E. H. Berger and M. W. Binger<sup>10</sup> (Rochester, Minn.) have studied the condition of the kidneys in 7 cases of alkalosis arising in the treatment of peptic ulcers at the Mayo Clinic. Evidence of impaired renal function was found in 5 cases after the alkalosis had been rectified.

*Pregnancy Toxæmia and Nephritis.*—J. L. McKelvey and H. E. MacMahon<sup>11</sup> (Baltimore) present observations on the lesions in the vascular system of patients who have been injured by pregnancy toxæmia, and who have eventually died with chronic nephritis. They believe that the sequence, toxæmia of pregnancy, chronic nephritis, and ultimate early death, occurs with striking frequency, a conclusion which is at variance with many other observers. The material is based on that obtained at autopsy on patients who have died in the obstetrical wards of Johns Hopkins Hospital. The material is thus practically confined to women who become pregnant again after a pregnancy toxæmia, and is thus only a sample of the after-history of pregnancy toxæmia. The authors consequently present no statistics, the value of the investigation depending on the pathological observations. They divide the material into two groups. First a group in which a pregnancy toxæmia had occurred, hypertension had persisted post partum, and after a varying period of time uræmia had ensued. In every case the hypertension had preceded the last pregnancy and had existed for from two to seven years before death. All cases in this group were found to present the characteristic lesion of malignant nephro-sclerosis as described by Volhard and Fahr. The second group consists of patients who died during or immediately following a pregnancy complicated by a non-convulsive toxæmia and in whom no history of previous hypertension was obtained. In this group the kidneys showed changes of tubulo-nephrosis, and in no case the characteristic lesion of malignant nephro-sclerosis.

*Essential Hæmaturia.*—D. W. Wilbur and J. T. Priestley<sup>12</sup> (Rochester, Minn.) have studied 100 cases diagnosed as essential hæmaturia in the Mayo Clinic. They give no clear description of what cases they include in this title, and no biochemical data are given. Of the 100 cases, 74 per cent were males, and the average age was 45 years. In 78 per cent of cases there was definite evidence of dental or tonsillar infection, while in a control group of 250 cases there was evidence of tonsillar or dental infection in 57 per cent. The authors consider that there is evidence that sepsis is an important factor. In 10 cases the kidneys were removed surgically, all the subjects being upwards of 60 years of age. No clinical history of these cases is given. It is stated that the glomeruli appeared essentially normal. Of the 10 cases, bleeding occurred subsequently from the opposite kidney in 2.

REFERENCES.—<sup>1</sup>*Arch. of Internal Med.*, 1935, lv, March, 411; <sup>2</sup>*Ibid.*, Jan., 131; <sup>3</sup>*Jour. Amer. Med. Assoc.* 1934, ciii, Dec. 8, 1760; <sup>4</sup>*Arch. of Internal Med.* 1934, liv, Sept., 389; <sup>5</sup>*Quart. Jour. Med.* 1935, n.s. lv, Jan. 1; <sup>6</sup>*Edin. Med. Jour.* 1935, xlii, Feb., 68; <sup>7</sup>*Amer. Jour. Med. Sci.* 1934, cxc, 536; <sup>8</sup>*Arch. of Internal Med.* 1934, liv, Oct., 483; <sup>9</sup>*Brit. Med. Jour.* 1935, May 25, 1065; <sup>10</sup>*Jour. Amer. Med. Assoc.* 1935, civ, April 20, 1383; <sup>11</sup>*Surg. Gynecol. and Obst.* 1935, lx, Jan. 1; <sup>12</sup>*Ann. of Surg.* 1935, ci, Jan., 647.

## RESUSCITATION.

Ivor J. Davies, M.D., F.R.C.P.

Yandell Henderson<sup>1</sup> (New Haven, Conn.) writes a practical article on resuscitation. The forms and degrees of asphyxia are detailed and the methods of artificial respiration and inhalational apparatus are evaluated. The tilting board rocking method of artificial respiration, developed by Eve<sup>2</sup> in England and Cornish<sup>3</sup> in California, deserves mention. The Drinker apparatus was

described in the MEDICAL ANNUAL, 1933, p. 343. The revival of intratracheal insufflation for clinical use is a valuable contribution to the art of resuscitation. For brief complete asphyxia, involving failure of breathing, the principal measure of resuscitation is artificial respiration reinforced by inhalation of carbon dioxide and oxygen. For prolonged asphyxia, inducing coma with depression of breathing, the principal measure of resuscitation is inhalation of carbon dioxide and oxygen, initiated, when needed, by artificial respiration. Artificial respiration apparatus of the laboratory type should be available in the operating-room. But such apparatus is not suitable for general use by laymen. Outside the operating-room and the hospital, reliance should be placed on inhalators and the Schafer prone pressure method of artificial respiration. The value of carbon dioxide as a respiratory stimulant has been fully described in previous volumes of this publication. Henderson's authoritative contribution should be read *in extenso*. A full bibliography of this important subject is appended.

REFERENCES.—<sup>1</sup>*Jour. Amer. Med. Assoc.* 1934, ciii, Sept. 15, 834; <sup>2</sup>*Lancet*, 1932, ii, 995, and 1933, ii, 740; <sup>3</sup>*Time*, 1934, xxiii, March 26, 49.

### RETINA: EMBOLISM OF CENTRAL ARTERY.

*Sir Stewart Duke-Elder, M.D., F.R.C.S.*

Embolism of the central retinal artery is a calamity as dramatic in its effects as it is difficult to relieve; and not the least important consideration in such cases is the time factor, for, unless a renewal of the circulation is possible in the matter of hours, permanent blindness is the inevitable result. The usual method of attempting to treat the condition is by a paracentesis, in the hope that the sudden drop of intra-ocular pressure may cause a vasodilatation and thus allow the embolus to pass along at any rate to a small vessel; or alternatively to administer amyl nitrite with the same end in view. Unfortunately the size of the retinal artery renders it relatively immune from these therapeutic

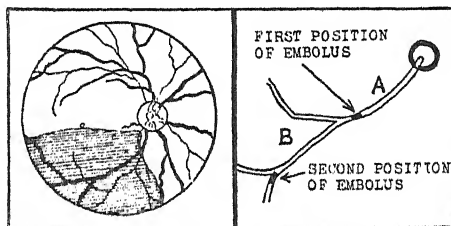


Fig. 58.

Fig. 59.

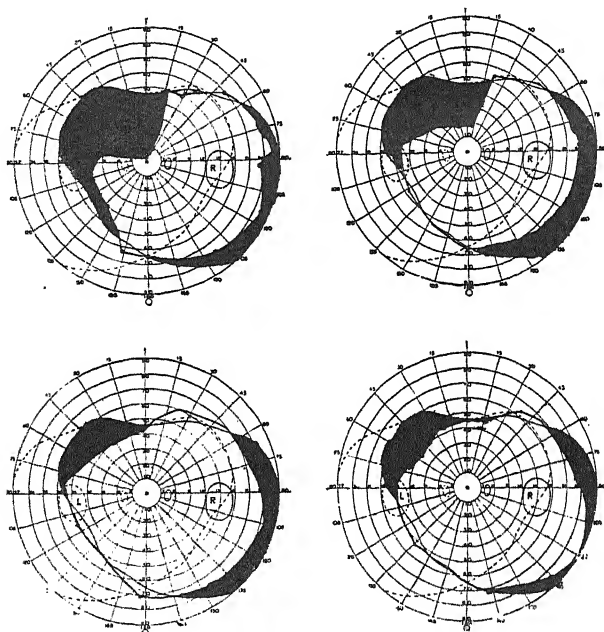
Fig. 58.—Fundus showing area of pallor (shaded) when first observed.

Fig. 59.—Diagram showing movements of embolus in right inferior temporal branch of retinal artery. See text.

attacks. H. Campbell Orr and J. H. Young<sup>1</sup> report a case wherein signal success followed the subconjunctival injection of *acetylcholine*. The patient noted a sudden visual failure twelve hours before he reported to hospital, and examination showed a blocking of the right inferior temporal branch of the retinal artery (Fig. 58). *Acetylcholine* (B.D.H.), 8 min., was injected subconjunctivally—4 min. in the lower temporal quadrant and 4 min. in the lower nasal quadrant, as far back as the equator of the globe. The patient was thereafter under constant observation for four and a half hours (7 p.m. till 11.30 p.m.). Ten minutes after his primary injection (7.10 p.m.) the ocular vessels, conjunctival and retinal, were greatly enlarged (about three times their

original size), while the retinal and choroidal veins became engorged. The area of pallor became well delineated.

At 7.30 p.m. the whitish exudate was becoming absorbed. At 8 p.m. the embolism moved into the arterial branch B (*Fig. 59*), while the branch A filled up with blood. At 8.30 p.m. (one and a half hours later) the embolism started to move down artery B, there being a distinct junction between the red advancing column of blood and the purplish-black embolus. The column of blood was convex at its advancing edge. The whitish exudate was much less, the arterial function now being evident. At 9.30 p.m. the whitish exudate had completely disappeared, and the embolus had reached the next arterial junction on the artery B. The fundal pallor was definitely receding, and started from the more peripheral borders bounding the horizontal and the vertical margins of the area, so that the macula lutea was freed from arterial strangulation.



*Fig. 60.*—Perimeter charts. Top left=6.50 p.m., Dec. 17, 1934. Top right=8 p.m. the same evening. Bottom left=9.30 a.m., Dec. 18, 1934. Bottom right=Jan. 4, 1935.  
(*Figs 58-60 by kind permission of the 'British Medical Journal'*)

Acetylcholine, 5 min., was again injected. This time the patient complained of extreme fullness of the globe ('as if it was bruised'), but said that he could see people distinctly. At 10.30 p.m. (three and a half hours later) the embolus was still fixed at the arterial junction of artery B. The pallor was receding very slowly. The acuity of vision had risen to 6/6, while only a small portion of the upper and inner field was missing. It was thus obvious that his central vision had been saved, even though he might not have a full peripheral field. At 11.30 p.m. the embolism remained fixed in the same position.

Investigation was suspended until 9.30 a.m. the next day, when the entire retinal system appeared normal, and although there was still pallor present

this was limited to an area along the course of this vessel. The retinal vessels were still dilated, while the ocular conjunctiva was oedematous. The visual acuity was now 6/4, and the field of vision showed a defect in the upper inner quadrant smaller than that shown before the injection of the previous day, and not interfering with central vision. The accompanying charts (*Fig. 60*) show the progressive increase in the field of vision. For the next few days the pallor of the affected area of the fundus persisted, but visual acuity was still 6/4 in the right eye. On the fourth day the field of vision was normal.

REFERENCE.—<sup>1</sup>*Brit. Med. Jour.* 1935, i, 1119.

### RETROPHARYNGEAL TUMOURS. *F. W. Watkyn-Thomas, F.R.C.S.*

L. Natanson<sup>1</sup> reviews our knowledge of the subject up to date. The condition is rare. In eighty years 85 cases have been reported, including 3 from the author's clinic in Moscow. By a 'retropharyngeal tumour' is meant a tumour which develops in the retropharyngeal space between the pharynx and the vertebral column. The space is bounded in front by the pharyngeal fascia, behind by the aponeurosis covering the prevertebral muscles, above by the basis cranii, below it passes into the posterior mediastinum, laterally it touches the neurovascular bundle, from which it is separated by the sheet of fascia from the sternomastoid sheath which is attached to the transverse processes. The space is filled with loose connective tissue in which lie the retropharyngeal lymphatics; in the fascial boundary the sympathetic is embedded.

These tumours are more common in women and usually appear in middle life or later. The few cases reported in infancy have all been malignant; of 37 cases reported before 1903, 22 are described as malignant; of 55 cases reported since then, only 7 were malignant. This discrepancy is probably explained by the suggestion that in the earlier series the neuromas were regarded as sarcomatous tumours. In the first series only 2 tumours were described as 'myxofibroma with ganglionic cells'; in the second series 17 are recognized as having a neurogenic origin. Natanson believes that the neuromatous tumours are the predominant retropharyngeal neoplasms, and that they arise from the ganglion cells or the trunk of the cervical sympathetic. They are thus analogous with the isolated tumours of the cervical sympathetic which arise behind the angle of the jaw under the sternomastoid; 10 such cases have been described. In some cases there seems to be a connection between these tumours and the neurofibromatosis of Recklinghausen. The idea of cervical sympathetic involvement is supported by the fact that the tumours are sometimes associated with Horner's syndrome, myosis and enophthalmos.

From a study of the literature and his personal experience, Natanson draws these conclusions: (1) Retropharyngeal tumours are generally innocent. In infants they are always malignant. (2) Usually the tumours are of neurogenic origin (neuromas, ganglioneuromas, and neurofibromas), arising from the cervical sympathetic. Next in frequency are the lipomas. Tumours of thyroid origin are rare. (3) Probably retropharyngeal tumours of the neurogenic type are a solitary manifestation of Recklinghausen's disease. (4) Retropharyngeal tumours are often associated with sympathetic symptoms, especially the Claude Bernard-Horner syndrome, either partial or complete. The signs should always be sought in any doubtful case. (5) X-rays are useful to establish the diagnosis and the situation of the growth. (6) Retropharyngeal tumours are apt to extend. For this reason it is well to operate; it is easier, also, to operate before the tumour has grown to a large size. (7) The trans-buccal route is only advisable when the tumour is in the mesopharynx, and there is no suspicion of goitre. (8) In all other cases the best approach is externally by a lateral pharyngotomy. With good illumination and proper arrangement of the

patient's head it is hardly ever necessary to resect the lower jaw. (9) As retropharyngeal tumours are nearly always innocent, it is useless to treat them with radium or X rays. This only makes later removal more difficult. It is only the malignant growths which are benefited by irradiation.

REFERENCE.—<sup>1</sup>*Rev. de Laryngol.* 1935, lvi, 51.

## RHEUMATIC DISORDERS, CHRONIC.

A. H. Douthwaite, M.D., F.R.C.P.

**BACTERIOLOGY.**—G. J. Griffiths<sup>1</sup> reports the results of investigation of anti-haemolysin titres in various forms of rheumatism. This work is based on the fact previously indicated by Todd that after infection with haemolytic streptococci the antihaemolysin titre of the serum increases considerably. This always happens, furthermore, after an attack of acute rheumatism. Griffiths shows that rheumatoid arthritis, infective arthritis, and spondylitis ankylopoietica give markedly high readings, whereas osteo-arthritis and spondylitis osteo-arthritis give only a few readings above normal. These facts are suggestive evidence of the part played by haemolytic streptococci in the production of rheumatoid arthritis and of the etiological relationship which is suspected to exist between this disease and acute rheumatism.

C. W. Wainwright<sup>2</sup> has investigated the claim of Cecil, Nicholls, and Stainsby (1929) to have isolated an atypical haemolytic streptococcus from the blood-stream and joints of over two-thirds of rheumatoid patients. He was unable to confirm their findings. Thus 94 blood cultures in 91 cases of rheumatoid arthritis yielded a *Str. viridans* in 1 case, diphtheroids in 4 cases, staphylococci in 4 cases, and Gram-positive bacilli in 3 cases. Fourteen joint cultures were negative. The sera of 90 per cent of cases, however, were found to possess agglutinins for haemolytic streptococci. All cases of rheumatoid arthritis gave positive skin reactions to one or more strains of streptococci, and 21 of 28 cases of this disease improved following intravenous injections of streptococcus vaccine prepared from the strain to which the skin was most sensitive.

**Influence of Diet in Development of Chronic Arthritis.**—F. C. Hall and W. K. Myers,<sup>3</sup> studying the life dietary habits of 75 patients with chronic arthritis, controlled by 30 patients without joint symptoms, conclude that dietary irregularities, whether in the direction of excess, deficiency, or lack of balance, cannot be shown to be directly related to the development of hypertrophic or rheumatoid arthritis. It is interesting to note, however, that 59 per cent of patients with hypertrophic arthritis had an excess of calories in their diet for years. This compares with 43 per cent of the control group. A much greater difference is encountered between patients with rheumatoid arthritis and the controls. Of the former, 20 per cent had subsisted on diets of inadequate caloric content, as compared with 3 per cent of the control group.

**Relationship of Endocrine Disease to Chronic Arthritis.**—Yearly the literature abounds with hypotheses of an association of endocrine disease and rheumatoid arthritis, but as yet the various theories are quite unsupported by fact. Clinically it has long been recognized that osteo-arthritis is prone to develop in the post-menopausal woman who is putting on weight. Improvement from thyroid medication is in such instances quite common. R. T. Monroe<sup>4</sup> has made a careful study of thyroid activity in osteo-arthritis and rheumatoid arthritis, and found that there was no association between the latter and hyper- or hypo-thyroidism. On the other hand, osteo-arthritis occurred in 32.6 per cent of 98 patients with myxoedema. This observation fully confirms the general impression referred to above.

**Gold Treatment of Rheumatoid Arthritis.**—J. Forestier<sup>5</sup> has introduced treatment by means of gold injections for rheumatoid arthritis, infectious

arthritis (gonococcal and others), and the attenuated conditions of tuberculous arthritis. He claims good results also in cases of ankylosing spondylitis. Allochrysine, myocerin, and oleo-solganol B are the preparations which have been extensively employed. Injections are given intramuscularly once a week in doses of 0.1 to 0.2 grm. The total amount for one series should not exceed 2 grm. Intervals of two months are allowed between each course, which is repeated as a rule from four to six times. Forestier claims that in view of the beneficial treatment of tuberculosis by gold, it is rational to use this metal for other infectious diseases. It is questionable whether this can be established as logic, and the opinion is probably biased by a view still held on the Continent that rheumatoid arthritis is etiologically connected with tuberculosis. Be that as it may, many favourable results have been reported, of which the reviewer has seen an appreciable number. It appears to him, however, that the treatment is by no means specific. The most favourable effects seem to arise in conjunction with focal reactions, e.g., pain and increased swelling of the joints. This is in every way comparable with the improvement which often follows the use of ammonium iodoxybenzoate (arthrytin), which is certainly not a specific. Sometimes severe general reactions are produced by gold injections, the commonest being a widespread eczema, fever, diarrhoea, and albuminuria. Owing to great individual variations of susceptibility to heavy metals, it is important to keep the patient under strict observation during the course lest severe or even fatal complications arise. Heavy metals are cumulative in action, and it is thus possible to observe violent general reactions at the completion of the course. For this eventuality, *sodium thiosulphate* has been recommended in 10-c.c. doses of 10 per cent solution intravenously. The injection should be repeated on alternate days for four to six doses. S. J. Hartfall and H. G. Garland<sup>6</sup> are of the opinion, however, that this preparation is useless in relieving symptoms of gold poisoning. The same authors report very favourably on the results of treating 100 cases of rheumatoid arthritis with preparations of gold. Ten cases were apparently cured and 56 showed marked improvement. It is noteworthy in this connection that painful exacerbations in the joints occurred in 47 cases and general toxic reactions were produced in 45 of their patients.

H. S. Pemberton<sup>7</sup> reports on 100 cases treated with gold and observed over a period of two years. Adjuvant treatment was standardized. Twelve were cured, 38 much improved, 38 improved, and 12 remained the same.

Clearly the treatment is of value, and its employment, in spite of risks, justified.

**Scapulo-humeral Peri-arthritis.**—G. Chaumet,<sup>8</sup> in a timely article, draws attention to a rheumatic manifestation which he terms “la péri-arthrite scapulo-humérale”. The picture is fairly constant. Pain is felt in the shoulder-joint, or in the upper part of the limb, and is associated with wasting of the surrounding muscles, especially the deltoid. Shoulder movements are painful and usually restricted. Not uncommonly there is associated pain which may appear to arise from radiculitis, plexitis, or peripheral neuritis.

The reviewer has seen many such cases, the majority being in men over the age of forty. Two types of history are common. The first tells of an acute attack of muscular rheumatism with stiff neck. This subsides in a week or two, but persistent and increasing pain is left in the shoulder of one side, and the joint movement becomes more and more restricted. The pain is at times agonizing even in the absence of attempted movement. Sleep is more and more disturbed, until the general health suffers severely. The other and less common history is that of a fall on the shoulder. After the initial bruising and discomfort have passed away residual discomfort persists in moderate

degree for a few weeks, and then the pain increases steadily though it seldom reaches the severity of that experienced in the first type. In neither case is it usual to see any radiographic abnormality. In both instances adhesions form between the various constituents of the soft peri-articular tissues. In particular, the rheumatic cases appear to involve the subacromial bursa, the long head of the biceps, and the tendon of the infraspinatus.

Chaumet favours treatment by radiant heat, diathermy, and gentle manipulations. In obstinate cases he claims to obtain good results by the application of X rays thrice weekly.

The reviewer's experience of physiotherapy for peri-arthritis of the shoulder has not been favourable. When little or no movement is obtainable in the shoulder-joint, the quickest and most efficacious method of dealing with the trouble is to *manipulate* under evipan anaesthesia. The loud reports which occur from rupture of the adhesions are indicative of the density of the scar tissue and of the futility of less vigorous methods of treatment. There is always much post-manipulative pain in these cases and morphine must be given freely for a day or two. The arm should be splinted in abduction and massage applied to the muscles about the joint twice daily. Active exercises starting within twenty-four hours of the manipulation are essential for the achievement of cure. The final disappearance of pain, muscular wasting, and limitation of movement is very striking. Complete recovery is the rule.

**Spinal Arthritis.**—An interesting summary of modern views of the pathology of spondylitis is presented by J. L. Miller.<sup>9</sup> The term 'osteo-arthritis' is used for the condition usually known as osteo-arthritis, for it is claimed to be essentially degenerative in character. Schmorl's observations on 4253 macerated spines show that the age incidence for the presence of osteophytes is the same for both sexes. None were found in the first two decades; in the third they were present in 10.7 per cent; in the fourth they featured in 36 per cent; in the fifth, 78 per cent; in the sixth decade they were present in 93 per cent. These figures are of importance and should act as a warning against placing too much stress on radiographic findings of osteo-arthritis in an attempt to explain obscure symptoms. The disease starts as a degeneration of the intervertebral disc.

Spondylitis ankylopoietica is the other form of spinal arthritis, and is regarded by many as a spinal form of rheumatoid arthritis. The disease starts in the small articulations and is clearly inflammatory in type. A peculiar and unexplained feature is that it occurs almost exclusively in males, whereas peripheral rheumatoid arthritis has a marked predilection for females.

**Gonococcal Arthritis.**—P. S. Hench, C. H. Slocumb, and W. C. Popp<sup>10</sup> have studied the effect of therapeutic *hyperpyrexia* on gonorrhoeal arthritis and rheumatoid arthritis. Whether diathermy, radiotherapy, hot baths, or cabinets are used, the resultant hyperthermia is characterized by the same physiological effects. The most important are: (1) Bacteriolysis of gonococci at a temperature of 106° to 107° F.; (2) Blood-flow—pulse-rate rises to 130 to 150 per minute; (3) Blood-pressure—initial rise, subsequent fall; (4) Superficial capillary flow increased; (5) Leucocyte count—initial fall, subsequent rise to 15,000; (6) Blood chlorides—marked drop; (7) Gastric juice—loss of chlorides; (8) Basal metabolic rate increased 7 per cent per degree of fever. Effects (1), (2), (4), (5), and (8) are probably beneficial to the arthritic. Bacteriolysis is of special value in gonococcal arthritis, which may be cured by repeated hyperthermal baths in more than half the cases. Other forms of arthritis derive only temporary benefit, if any. Confirmation of this point is supplied by C. L. Short and W. Bauer,<sup>11</sup> who deprecate hyperthermia for rheumatoid arthritis.



The excessive loss of chlorides from the body is due to sweating, and may lead to disappearance of free hydrochloric acid from the gastric juice. The blood chlorides may fall 50 mgrm. or more per 100 c.c. Exhaustion, nausea, and cramp arise from this effect, which may be counteracted by the exhibition per os of large quantities of 0.6 per cent saline. The authors use for choice the Kettering hypertherm cabinet through which humidified air is forced and heated electrically.

**Gonococcal Complement-fixation Test.**—W. K. Myers and C. S. Keefer<sup>12</sup> have investigated the value of this test in 43 patients with proved gonococcal arthritis (gonococci recovered from synovial fluid) and 66 patients with other types of arthritis. A positive reaction was encountered in 86 per cent of the cases of gonococcal arthritis and in only 2 of the controls. The reaction of blood serum and synovial fluid is almost always identical.

REFERENCES.—<sup>1</sup>*Lancet*, 1934, ii, Aug. 4, 251; <sup>2</sup>*Jour. Amer. Med. Assoc.* 1934, ciii, Nov. 3, 1357; <sup>3</sup>*Arch. of Internal Med.* 1935, lv, March, 403; <sup>4</sup>*New Eng. Jour. Med.* 1935, ccxii, June 6, 1074; <sup>5</sup>*Lancet*, 1934, ii, Sept. 22, 646; <sup>6</sup>*Ibid.* 1935, July 6, 8; <sup>7</sup>*Ibid.* i, May 4, 1037; <sup>8</sup>*Presse méd.* 1934, xlii, Dec. 22, 2053; <sup>9</sup>*Arch. of Internal Med.* 1934, liv Aug., 161; <sup>10</sup>*Jour. Amer. Med. Assoc.* 1935, civ, May 18, 1779; <sup>11</sup>*Ibid.* June 15, 2165; <sup>12</sup>*New Eng. Jour. Med.* 1934, ccxi, July 19, 101.

Ivor J. Davies, M.D., F.R.C.P.

**Physiotherapy.**—W. Bierman and E. H. Fishberg<sup>1</sup> (New York) have studied some of the physiological changes during hyperpyrexia induced by physical means. They quote a pertinent remark of William H. Welch,<sup>2</sup> who wrote: "Enlightened physicians have held the opinion that fever is a process which aids in the elimination or destruction of injurious substances which gain access to the body. The doctrine of evolution indicates that a process which characterizes the reaction of all warm-blooded animals against the invasion of harmful substances has not been developed to so wide an extent and is not retained with such pertinacity without subserving some useful purpose." The authors' observations have been made of some changes occurring in the body as a result of the elevation of its temperature by physical means. These observations included changes in the skin surface temperature, relationship between the mouth and rectal temperatures, velocity of blood-flow, pulse-rate, blood-pressure, blood volume, blood viscosity, respiratory excursions, number of white blood-cells, erythrocytic sedimentation rate, chemistry of the sweat, blood, urine, and gastric contents, and the serological reactions of the blood.

F. W. Bishop, E. Lehman, and S. L. Warren<sup>3</sup> (Rochester, N.Y.) studied a comparison of the three electrical methods of producing hyperthermia—diathermy, radiotherapy, radiant energy. They found that while any of the electrical methods proposed can be made to work efficiently and safely in artificial hyperthermia, the radiant energy (infra-red) method described seems to be the most convenient and economical method in their experience. There does not appear to be any difference in the clinical effects and results from the various methods used. All these methods rely on the circulation of the blood for the redistribution of heat in the body from the site of application of the energy.

W. J. Turrell<sup>4</sup> (London) opened a discussion on short-wave diathermy at the Royal Society of Medicine. The theoretical aspect was explained at length and he expressed a firm belief that the advent of short-wave therapy opens up a field of great possibilities hitherto totally unexplored. The treatment has been found of extreme value in cases of infective arthritis as well as of chronic fibrositis in patients with low temperatures, low red-cell counts, and high sedimentation rates. R. S. Woods voiced a warning against the employment of this potentially dangerous physical agent by unqualified persons.

Kerr Russell pleaded that interest should be taken in what he considered one of the most important methods of treatment which had yet become available in the whole range of physical medicine. The treatment was just at its beginning, important developments would inevitably take place, and if the profession neglected this extremely valuable method, it would undoubtedly be exploited by the quack.

F. P. Lowry<sup>5</sup> (Newton Hospital, U.S.A.) presents the physical and clinical facts of phototherapy in an impartial and practical form and his contribution can be well recommended to those practising physical therapy. It is evident that each source of phototherapy has its own limited and particular field of usefulness.

REFERENCES.—<sup>1</sup>*Jour. Amer. Med. Assoc.* 1934, ciii, Nov. 3, 1354; <sup>2</sup>*Med. News*, 1888, lii, 365, 393, 539, 565; <sup>3</sup>*Jour. Amer. Med. Assoc.* 1935, civ, March 16, 910; <sup>4</sup>*Proc. Roy. Soc. Med.* 1935, xxviii, Jan., 301; <sup>5</sup>*New Eng. Jour. Med.* 1934, cexi, July 26, 171.

### RHEUMATIC INFECTION IN CHILDREN.

*Reginald Miller, M.D., F.R.C.P.*

**Bacteriological Causation.**—In last year's MEDICAL ANNUAL (p. 369) the connection between hæmolytic streptococcal infections and juvenile rheumatism was discussed at some length. B. Schlesinger, A. G. Signy, and W. W. Payne<sup>1</sup> have returned to this subject and have published further studies in which they have been able to demonstrate streptococcal precipitins in the blood of rheumatic patients following acute streptococcal sore throats. The tests for these are more frequently and strongly positive in rheumatic patients, usually between the tenth and thirtieth day following the infection, but are not confined to them, as tonsillitis may set up the same sequence of events in non-rheumatic patients. They conclude that "the tissues at that time" (i.e., after the latent period) "appear to be particularly vulnerable and it is possible that this allows some as yet undiscovered cause of rheumatism to enter the body; or perhaps this state of increased susceptibility permits an already present but latent causal agent to enter into a state of activity. It is conceivable that a virus may be the answer to the problem."

A week later the first two authors with C. R. Amies<sup>2</sup> published the results of an attempt to obtain evidence in favour of the virus hypothesis as a factor in the causation of acute rheumatism. They summarize their results as follows:—

1. The deposits obtained by high-speed centrifugation of pericardial fluid from cases of acute rheumatic pericarditis contain particles which morphologically resemble virus elementary bodies. Similar bodies have been found in the deposit obtained from one pleural exudate in association with rheumatic pneumonia.

2. Relatively pure suspensions of these bodies in formal saline have been prepared. These suspensions are specifically agglutinated by the sera of patients who are suffering from, and successfully resisting, an acute rheumatic infection. The sera of patients in whom the infection is quiescent fail as a rule to agglutinate these suspensions. Completely negative reactions were also obtained with the serum of normal persons and of patients suffering from various non-rheumatic infections.

3. On the evidence above summarized it is suggested that the bodies found in pericardial exudates represent the actual infective agent of acute rheumatism.

4. The importance of streptococcal infection as a factor in the etiology of the disease is recognized. It is suggested that the lowered resistance produced by such infections enables the virus to enter the body or, if the virus is already lying latent in the tissues, allows it to assume active characters.

The authors' paper contains a note on the photomicrography of the virus by J. E. Barnard.

This interesting result of their investigations is put forward by the authors very tentatively and nothing like finality is claimed for their conclusions. It is interesting to note that the rôle played by the hæmolytic streptococcus is regarded as merely a contributing factor in the production of an acute rheumatic attack, which was the line taken by the reviewer in the MEDICAL ANNUAL of last year (p. 370), where he wrote: "Although, therefore, it may be taken as proved that the hæmolytic streptococcus can set up rheumatism, especially in epidemic form, it does not follow that all attacks of rheumatism are set up by it, still less that rheumatism is due to a blood-stream infection by a hæmolytic type of streptococcus or is itself a directly communicable disease." If it is accepted that the hæmolytic streptococcal infection is merely the trigger which fires off the rheumatic attack, it is easier to suppose that it might activate a non-hæmolytic streptococcus than a virus. After all, the non-hæmolytic streptococcus is a closely associated micro-organism, is known to be a constant inhabitant of the alimentary tract, and has been frequently recovered from rheumatic lesions. Such a sequence of events would be in line with what is already known. Further evidence in support of the virus factor will be awaited with interest. [One point in its favour which the authors might have legitimately advanced concerns the histopathology of rheumatism. The peculiar tissue changes seen in this disease are unlike known reactions to streptococcal infections, whereas I am told that they show no little similarity to the lesions found in virus infections.—R.M.]

**Tropical Rheumatism.**—Amongst the minor questions in the problem of the causation of rheumatism has been its world distribution. The late J. Tertius Clarke,<sup>3</sup> in support of his view that acute rheumatism was a rat-borne infection, emphasized the extreme infrequency of the disease in tropical districts. P. Kutumbiah<sup>4</sup> contradicts this and reports on 50 cases of juvenile rheumatism from Vizagapatam, a tropical city in South India. The type of case he records does not differ much from the sort with which we are familiar in England. There is not, perhaps, very much importance in this particular point, for it is well recognized that juvenile rheumatism is overwhelmingly a disease of temperate climes. Nor does its occurrence in tropical countries necessarily minimize the importance of the effect of damp and cold in the production of juvenile rheumatism in England. If, as most people agree, the occurrence of rheumatism is closely connected with tonsillar infection, it may well be that among the predisposing factors in one climate are damp and cold and in tropical climates heat and dust.

REFERENCES.—<sup>1</sup>*Lancet*, 1935, i, 1090; <sup>2</sup>*Ibid.*, 1145; <sup>3</sup>*Jour. Trop. Med. and Hyg.* 1930, xxxiii, 249; <sup>4</sup>*Ind. Jour. Pediat.*, 1935, ii, 215.

**RINGWORM.** (*See SKIN, FUNGUS INFECTION OF.*)

## ROSACEA.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

Rosacea (or acne rosacea as it used to be called) has for long been thought to be associated with disturbance of the digestive function, and a considerable number of observations have been made in rosacea cases by means of fractional test-meals. W. H. Brown (1925) and S. Eastwood (1928) have published series of cases. Their researches tended to show a tendency to hypochlorhydria in rosacea cases as compared with normal controls. W. H. Brown, M. S. Smith, and A. D. McLachlan<sup>1</sup> have added another 150 observations to Brown's original 50 cases, and have also investigated 216 cases of other dermatoses. Their results do not show any marked variation from Brown's or Eastwood's previously recorded results. They find, however, that achlorhydria and extreme hypochlorhydria is lower in the rosacea group than in other dermatoses, 28

per cent as compared with 35 per cent. The results of these tests have led the authors to conclude that marked subacidity is not a feature peculiar to rosacea as was originally thought. The findings, however, do not detract from the well established fact that strict dietetic treatment in combination with large doses of HCl brings about marked improvement in rosacea.

S. Shone and F. P. B. Whitwell<sup>2</sup> have investigated 40 cases of this disease, and have come to the conclusion that the gastric acidity is practically within normal limits, as demonstrated both by the ordinary fractional test-meal and by the histamine test-meal. They think the rosaceous reflex is induced by an increase of tension in the stomach wall. This increase of tension may be due to one or more of the following factors: (1) Delay in emptying; (2) Feeble peristalsis; (3) An easily distensible stomach due to hypotonia; (4) Over-rapid peristalsis; and (5) Gastric spasm. The action of hydrochloric acid, alkalis, and carminatives in rosacea is to give slow, deep, unflurried gastric peristalsis and good muscular tone. The gastric tension is thereby relieved, the indigestion disappears, and the vasomotor reflex of rosaceous flushing depending on the tension is inhibited. The gastric neurosis is due to many causes, amongst them being adverse psychological influences, poor general muscular tone, and reflex effects from disturbance in an abdominal viscus. In a few cases the reflex may be from a lesion in the gastric mucosa itself, such as gastritis or an ulcer.

REFERENCES.—<sup>1</sup>*Brit. Jour. Dermatol. and Syph.* 1935, xlvii, May, 181; *Lancet*, 1934, ii, July 7, 11.

### **SALIVARY FISTULÆ.**

*Sir W. I. de C. Wheeler, F.R.C.S.I.*

U. V. Portmann<sup>1</sup> points out that fistulæ of the submaxillary and sublingual glands do not require any treatment as a rule. In obstinate cases the glands can be removed. He recommends treatment by *radiation* to suppress secretion, which thus obviates the necessity for operation. It is the parotid fistulæ which are particularly obstinate, and but few of them close spontaneously. Two types of fistulæ are encountered: the first is caused by opening Stenson's duct, and the second are sinus tracts originating in the glandular substance. They are usually due to accidental lacerations or surgical incisions; occasionally they form as a result of salivary calculi. Portmann deals with the many operations designed for the closure of such fistulæ and the causes of failure. Roentgen therapy is recommended. The secretory activity of the salivary glands is suppressed by this method and brings about a cessation of drainage in parotid fistula. The function of the gland may be resumed in about four months, but meantime the fistula has closed. High voltage doses are necessary (180 or more kv.) and heavy filtration (not less than 0.5 mm. copper). The method of applying radiation is not important if the dose is large enough. A slight erythema reaction should appear in about three weeks and subside in another month. Epilation occurs, but the hair will return in about four months.

REFERENCE.—<sup>1</sup>*Ann. of Surg.* 1935, May, 1175.

### **SAND-FLY FEVER.** (*See PHLEBOTOMUS FEVER.*)

### **SCALENUS ANTICUS SYNDROME.** *Sir W. I. de C. Wheeler, F.R.C.S.I.*

Under this heading A. Ochsner, M. Gage, and M. De Bakery<sup>1</sup> draw attention to signs and symptoms arising from pressure on the brachial plexus and subclavian artery by the scalenus anticus muscle. The syndrome is well known, but in former years search was made for a cervical rib, and in its absence pressure against a normal first rib was suspected. Recent literature would suggest that whatever the actual cause of the pressure on the nerve-trunks and artery,

division of the scalenus muscle promotes a cure. Adson drew attention to the beneficial effects of release of the scalenus from its attachment to the first rib in 1927 (*MEDICAL ANNUAL*, 1928, p. 406).

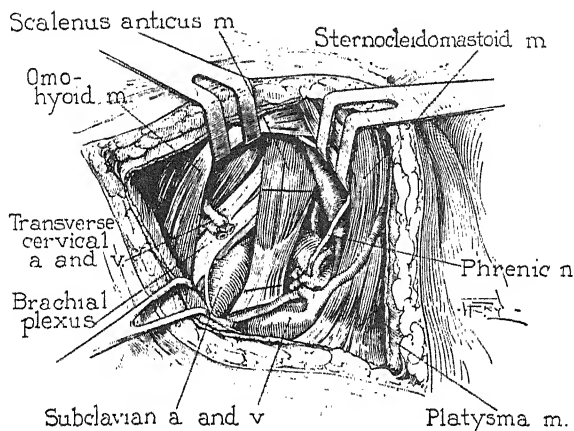


Fig. 61.—Exposure of scalenus anticus muscle prior to its resection. Phrenic nerve has been mobilized from anterior surface of muscle and is retracted medially by means of a retractor. Omohyoid muscle is retracted laterally by retractor in upper and left hand corner of wound. Transverse cervical artery and vein have been ligated, exposing scalenus anticus in region of its attachment to first rib. As shown in illustration, subclavian artery and brachial plexus are pinched in angle between thickened scalenus anticus muscle and first rib.

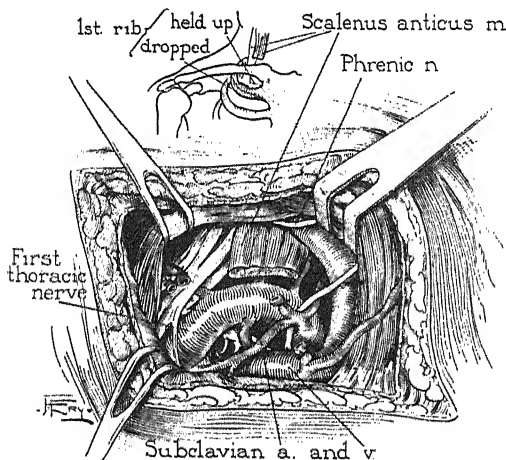


Fig. 62.—Relative positions of structures following resection of scalenus anticus muscle. Attachment of scalenus anticus muscle and first rib has disappeared into depths of wound, due to release of tension produced by contraction of muscle. Subclavian artery and brachial plexus resume their normal positions. (Figs. 61, 62 by kind permission of the 'American Journal of Surgery'.)

The lesion is usually found in women on the right side. Pain in the shoulder, radiating from the supraclavicular region down the arm and involving the ulnar and flexor surfaces of the forearm, is common. The pain may reach

the side of the neck and ear. The severity of the pain is very variable. Pressure elicits tenderness over the scalenus muscle in the supraclavicular region and usually produces pain down the ulnar side of the arm. Depression of the shoulder increases the pain. The writers of the article believe that the diagnosis is simple if the condition is borne in mind. It may be confused with such conditions as cervical rib, subacromial bursitis, supraspinatus tendon rupture, cervicodorsal sympatheticalgia, Raynaud's disease, and brachial neuritis. The clinical picture in cases of cervical rib is identical. Cervicodorsal sympatheticalgia resembles the scalenus anticus syndrome very closely, but is completely relieved by novocain block of the cervicodorsal sympathetic ganglia. Raynaud's disease is usually bilateral.

Excellent results follow division of the scalene muscle. *Inter alia* the first rib falls to a lower level when released from the muscular attachment, and this in turn relieves the pressure on the brachial plexus and subclavian artery. Ochsner, Gage, and De Bakey describe the technique of operation as follows. [With ordinary precautions the operation is never difficult; most surgeons are familiar with the anatomy of the subclavian artery and brachial plexus. The phrenic nerve requires attention.—W. I. de C. W.] A transverse incision is made above the clavicle with its mid-point over the posterior border of the sternomastoid. After division of the superficial tissues the posterior border of the sternomastoid muscle is defined. The muscle is retracted and if necessary partially divided. In the depth of the wound the attachment of the scalenus to the first rib can be defined with the finger. The transverse cervical artery may require ligature. The omohyoid is retracted laterally. The phrenic nerve is identified coming from above downwards and crossing the muscle. The subclavian artery and brachial plexus are carefully separated from the deep surface of the muscle and a curved spatula or retractor is passed round the deep surface of the latter to protect the artery. The muscle is divided near its attachment, cutting a few fibres at a time. Ochsner and his collaborators recommend resection of a portion of the muscle. (Figs. 61, 62.)

REFERENCE.—<sup>1</sup>*Amer. Jour. Surg.* 1935, June, 669.

## SCARLET FEVER.

J. D. Rolleston, M.D., F.R.C.P.

EPIDEMIOLOGY.—J. Mikler,<sup>1</sup> who records his observations on 3000 cases of scarlet fever admitted to the Hôpital Trousseau, Paris, between 1924 and 1933 inclusive, illustrates the rarity of the disease in infancy by the fact that only 5 cases in this series occurred in the first year of life as compared with 60 in the second and 238 in the third year. The maximum was reached at the age of 6 with 333 cases. From 7 to 8 there was a fall to 302, and after 9 there was a sharp decline, until the lowest figure was reached with 3 cases at 15. The number of cases admitted during the first six months of the year was almost double that of those in the last half. The incidence diminished rapidly during the summer, and showed a recrudescence during the last three months of the year: 42 (2.9 per cent) of the 3000 cases were fatal. During the first two years, when the children were not isolated in separate chambers, 51 out of 544 cases (10.6 per cent) were fatal, whereas during the last seven years, when individual isolation was established, only 61 deaths (0.41 per cent) occurred among 2456 cases. Another result of individual isolation was the disappearance of diphtheria from the scarlet fever block. Every child who was found to be Schick-positive on admission was immunized by anatoxin. The fatality was highest among the youngest children, the chief cause of death being bronchopneumonia (26 cases), and then in order of frequency: malignant scarlet fever (19 cases), suppurative otitis (17 cases), mastoiditis (6 cases), acute meningitis (6 cases), appendicular peritonitis (3 cases), and empyema, cerebral

arteritis, erysipelas, and nephritis (1 case each). Isolation of thirty to thirty-five days was found sufficient to prevent return cases except in cases complicated by tonsillitis, otitis and suppuration, which had to be isolated until complete recovery had taken place.

**SYMPTOMS AND COMPLICATIONS.**—J. S. Anderson<sup>2</sup> states that the *relapse rates* at the Leeds City Hospital for the years 1931, 1932, and 1933 were 3.6, 4.0, and 4.3 per cent respectively, which are considerably higher than that of about 1.0 per cent given by the reviewer in his text-book. He attributes these relatively high rates to the present mild type of scarlet fever providing insufficient stimulus for the development of immunity. Since October, 1933, he has Dick-tested every patient not given scarlet fever antitoxin on admission, and in the case of a positive reaction he has given a course of graduated skin-test doses of toxin (500, 2000, 5000, and 20,000 skin-test doses at four-day intervals), with the result that only one of the 246 patients so treated had a relapse.

J. Todesco<sup>3</sup> records a case of *three attacks of scarlet fever* within four months in a boy aged 5 years. Each attack was treated with 10 c.c. of scarlatinal antitoxin. The only complication was secondary adenitis in the third attack.

J. Raulot-Lapointe,<sup>4</sup> who records 25 cases, of which 23 were in primiparæ and 2 in multiparæ, states that the frequency of *puerperal scarlet fever* varies with different writers and periods. In the great majority of cases the patients are young primiparæ who have had a normal pregnancy and full-term delivery. A history of infection can often be obtained. Severe forms, which were frequent formerly, are rarely seen nowadays.

J. M. Faulkner and R. Ohler<sup>5</sup> studied *the effect of scarlet fever on the heart* in 171 cases during and after the acute stage, and in 11 cases obtained abnormal electrocardiograms which did not appear before the thirteenth day and consisted in prolongation of the P-R interval in 5 cases and flattening or inversion of the T wave in 6. A further study of 600 cases of scarlet fever from one to three years after the attack showed that 7 had developed heart disease which was indistinguishable clinically from rheumatic endocarditis.

Ferrand, H. Schaeffer, and Martin<sup>6</sup> report a case of *disseminated encephalomyelitis* which developed on the fourth day of a mild attack of scarlet fever in a boy aged 6 years. There was no sign of nephritis. Complete recovery took place in one and a half months.

L. Sabadini,<sup>7</sup> who has collected 20 cases in patients aged from 7 months to 30 years including a fatal one of his own in a boy aged 14, states that *acute primary peritonitis* is a very rare complication of scarlet fever, and in the absence of operation is invariably fatal in two or three days. It is not accompanied by lesions of the abdominal organs. It may occur at any stage of the disease.

A. L. Hoyne and J. H. Bailey,<sup>8</sup> who report 282 *return cases* among 4315 scarlet fever patients discharged from hospital between May 1, 1932, and July 6, 1933, come to the following conclusions: (1) Contrary to the usual opinion the patient who had had an uncomplicated attack was as liable to give rise to return cases as the patient who had suffered from abnormal discharges during his attack. (2) The adult patient was not a negligible factor in the transmission of the disease. (3) The number of return cases bears an inverse ratio to the length of the quarantine period, and is not dependent on season. (4) The return case of scarlet fever contracted from one of a mild type is frequently unusually severe. The converse is also true. (5) The spread of scarlet fever cannot be effectively controlled by the methods of quarantine in general use, but the morbidity and mortality of scarlet fever, like that of diphtheria, can only be satisfactorily reduced by active immunization.

F. Ciantini<sup>9</sup> illustrates the rarity of the *coexistence of scarlet fever and enteric fever* by the following figures. Murchison in his long and extensive experience saw only 2 examples, and Caiger had only 8 cases of typhoid among 48,366 scarlet fever patients. The coexistence of scarlet fever with paratyphoid is rarer still, as Ciantini could find only 2 cases in the literature of the last thirty-four years. He now reports the following 3 cases which were the only ones of the kind which occurred among 9609 scarlet fever patients admitted to the A. Bassi Hospital for Contagious Diseases, Milan, during the period 1905-33. The first case was that of a boy aged 11 who developed a mild and uncomplicated attack of typhoid fever in convalescence from scarlet fever. The second case was that of a girl, aged 14, in whom the two diseases were concurrent in the acute stage. Uncomplicated recovery also took place in this case. The third case, which occurred in a boy, aged 7, was an example of the coexistence of paratyphoid B with scarlet fever. Death from septicæmia ensued after a week's illness.

A. G. Mitchell, W. C. Nelson, and T. T. Leblanc<sup>10</sup> made a study of the *skin reaction to tuberculosis* in the acute stage of 854 cases of scarlet fever, and found that there was a depression of allergy which disappeared during convalescence. It follows, therefore, that failure to elicit a skin response to tuberculin during the acute stage of scarlet fever cannot be regarded as evidence that the patient does not normally give a positive reaction.

DIAGNOSIS.—G. M. Gasul and P. S. Rhoads,<sup>11</sup> from a study of several hundred cases of scarlet fever, came to the following conclusions: (1) The diagnosis of scarlet fever cannot depend upon a single Dick test. A persistently positive reaction during the whole course of the disease throws considerable doubt on the diagnosis of scarlet fever, whereas a positive reaction at an early stage followed by a negative reaction confirms the diagnosis of scarlet fever. (2) Negative cultures for hæmolytic streptococci at the beginning of the disease on a properly prepared medium and properly interpreted are strong evidence against the correctness of a diagnosis of scarlet fever. A positive culture, however, in the presence of other clinical findings of scarlet fever confirms the diagnosis.

S. Friedman<sup>12</sup> found *eosinophilia* in 46 out of 100 cases of scarlet fever in a single count. It was most frequently present in the early stage in mild cases, when its incidence ranged from 60 to 70 per cent. As the mild cases are often the most difficult to diagnose, Friedman suggests that a high eosinophil count is useful for diagnosis. In a subsequent paper Friedman<sup>13</sup> maintains that the formation of antitoxin and the presence of free antitoxin in the blood constitute the most logical explanation of the eosinophilia.

PROPHYLAXIS.—W. J. Benson and A. L. K. Rankin,<sup>14</sup> who record the results of active immunization of 112 probationer nurses in the Edinburgh City Fever Hospital over a period of nine years, come to the following conclusions: (1) The Dick test for all practical purposes is a reliable index of immunity to scarlet fever. (2) Active immunization with graded doses of toxin will rapidly and effectively protect the majority of susceptible persons against scarlet fever. To obtain a lasting immunity at least 80,000 to 100,000 skin-test doses must be given in five weekly subcutaneous injections of 500, 2000, 5000, 25,000, and 50,000 skin-test doses. Systemic reactions must be expected in 10 per cent of those immunized. (3) Scarlet fever and diphtheria prophylactics may be safely administered as a combined injection. (4) The nursing staffs of fever and children's hospitals should be actively immunized against scarlet fever. (5) As long as the present mild phase of scarlet fever persists, a method entailing not only five injections but also the probability of systemic reactions is not practicable for general application in Great Britain.



F. H. Fraser and D. T. Fraser<sup>15</sup> state that during the last seven or eight years immunization of the nurses undergoing training with five or more doses of scarlet fever toxin has been employed systematically in five hospitals in Canada, with the result that there has been a diminution in the incidence of scarlet fever compared with previous years in which there had been no immunization. A similar reduction in the incidence of the disease had occurred in a children's hospital where active and passive immunization had been performed on admission. In the United States, according to H. S. Cumming,<sup>16</sup> active immunization against scarlet fever has been used on only a very limited scale, first because five injections are required and are often accompanied by severe reactions, and secondly because scarlet fever at present is a mild disease.

A. Ismail<sup>17</sup> states that in Turkey, where there had been a decided rise in the incidence of scarlet fever since 1920, inoculation with five doses of polyvalent scarlatinal toxin had caused a considerable drop in the frequency of the disease and reduced the amount of Dick-positive cases from 62.4 to 16.7 per cent.

In a comparison of the protective power of commercial scarlet fever antitoxin and convalescent scarlet fever serum, P. S. Rhoads and B. M. Gasul<sup>18</sup> found that there were cases in which the usual dose of convalescent serum failed to protect susceptible individuals, whereas scarlet fever antitoxin always afforded complete protection. Moreover, convalescent serum cost much more per antitoxic unit than commercial antitoxin.

TREATMENT.—P. F. Lucchesi and J. E. Bowman<sup>19</sup> record their observations on 5377 patients with scarlet fever admitted to the Philadelphia Hospital for Contagious Diseases during the years 1927, 1928, and 1929, of whom 3045 were treated with *antitoxin*, while 2332 served as controls. Comparison of the two groups of cases with one another showed a slight decrease in the number of febrile days in the mild and moderate cases and a substantial reduction in the severe cases treated with antitoxin. The incidence of complications was definitely less in the serum-treated cases in comparison with those not so treated. Serum reactions occurred in 36 per cent of the cases treated with antitoxin, being lower (34.5 per cent) in cases treated with *ephedrine* and *calcium* than in those not so treated (38.8 per cent).

E. Friedman, A. L. Essermann, and M. H. Black<sup>20</sup> recommend five, and if necessary six or seven, *nasal instillations* of scarlatinal toxin as a clean and painless method of active immunization and free from serious local and constitutional effects. In two groups of children aged from 3 to 17 years, so treated, the method was completely successful in 60 and 71 per cent respectively, and partial immunity was conferred in a considerable percentage of the rest. In children under three years of age a total of 115,000 skin-test doses should be given and in those over three 202,000.

G. P. Hunt<sup>21</sup> made comparative observations on 273 cases of scarlet fever in which *tonsillectomy* and *adenoidectomy* were performed at various stages of the disease, with 285 cases which had no operation, and came to the conclusion that in suitable cases these operations were safe and logical procedures, and that the earlier they were performed the less likely were complications to occur and the shorter the duration of the contagious period.

REFERENCES.—<sup>1</sup>*Thèse de Paris*, 1934, No. 810; <sup>2</sup>*Arch. of Dis. Child.* 1934, ix, 373; <sup>3</sup>*Lancet*, 1935, i, 548; <sup>4</sup>*Thèse de Paris*, 1934, No. 504; <sup>5</sup>*Amer. Jour. Med. Sci.* 1935, clxxxix, 352; <sup>6</sup>*Paris méd.* 1935, i, 245; <sup>7</sup>*Presse méd.* 1935, xliii, 605; <sup>8</sup>*Jour. Amer. Med. Assoc.* 1934, ciii, 1051; <sup>9</sup>*Riv. di clin. Ped.* 1934, xxxii, 1367; <sup>10</sup>*Amer. Jour. Dis. Child.* 1935, xlix, 695; <sup>11</sup>*Ibid.* 603; <sup>12</sup>*Ibid.* 933; <sup>13</sup>*Ibid.* 1256; <sup>14</sup>*Lancet* 1934, ii, 1357; <sup>15</sup>*Bull. Off. internat. d'Hyg. publ.* 1934, xxvi, 1958; <sup>16</sup>*Ibid.* 1980; <sup>17</sup>*Ibid.* 1982; <sup>18</sup>*Jour. Amer. Med. Assoc.* 1934, cii, 2005; <sup>19</sup>*Ibid.* ciii, 1049; <sup>20</sup>*Jour. of Pediat.* 1934, v, 504; <sup>21</sup>*New Eng. Jour. Med.* 1935, cexii, 665.

**SCHISTOSOMIASIS.**

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

**ETIOLOGY.**—At the suggestion of C. C. Chesterman an anomalous form of schistosomiasis found in the Stanleyville district of the Belgian Congo has been investigated by A. C. Fisher<sup>1</sup> with interesting results. Cases of intestinal schistosomiasis attributed to *S. hæmatobium* had been reported from Central West Africa in areas where the inhabitants commonly defæcate into the water of streams, and as human autopsies were not obtainable material from experimentally infected mice and one sheep was studied minutely, and a full description of the adult worms is recorded, which does not reveal any morphological characters by which they can be distinguished from human *S. hæmatobium* or *S. bovis* of animals. The ova, however, show a size intermediate between those of the last-mentioned species, although in shape they may resemble either forms, but the spine of the new species, named *S. intercalatum*, is well developed and may reach a length of  $20\mu$ , which serves to distinguish the ova from those of *S. hæmatobium*, while the new ova never reach the large dimensions of *S. bovis* and *S. matthei* ones. It is therefore concluded that the Stanleyville schistosome is a new variety intermediate in position between *S. hæmatobium* and *S. bovis*. No animals were found to be naturally infected by *S. intercalatum*, but infected mice may show the ova in their faeces within 41 days, and the adult worms were evenly distributed throughout their portal system, and no gravid female was found apart from a male. The new species has been found along a stretch of about 100 miles of the Congo river. The intermediate host is *Physopsis africana*, 2 to 3 per cent of which were found to be giving off human cercariæ in June and July, but attempts to infect these snails experimentally failed.

Clinically the human infections were mild, for 50 per cent of school-children, not complaining of any disability and without fever or any urticarial or erythematous reactions, were infected, so the parasite is a benign form or there is inherited tolerance to it. The splenic index was not affected nor were lung symptoms more frequent in the infected children. Of 43 hospital patients showing signs of infection, 23 complained of dysentery and 14 of abdominal pain, and only 6 showed liver enlargement and none had marked anaemia. The sputum and urine were always free from ova. Sigmoidoscopical examination may show petechial patches or a granular appearance of the mucous membrane. After the age of 20 to 30 no infections were found and any infected adults are free from symptoms. *Tartar emetic* was effective in the treatment, but *acriflavine* was found to kill cercariæ and miracidia in dilutions at which tartar emetic was quite inert, and acriflavine proved more effective in a trial of 49 cases in total doses of 0.02 grm. per kilo in children up to 20 kilo, 0.015 grm. from 20 to 30 kilo, and 0.01 grm. per kilo body weight in adults, with a total maximum of 0.7 grm. A 2 per cent aqueous solution in five equal daily doses orally was given in the morning two hours before the first meal following a brisk purgative each night. Only degenerate ova were found in 43 of the 49 cases after the five-day course. A  $\frac{1}{3}$  per cent solution of the cheaper *proflavine* was also successful in the same quantities within five days in 7 cases. In 17 cases ova reappeared after one to three months in the stools.

In Mauritius A. R. D. Adams<sup>2</sup> has studied urinary bilharzial disease, and he found *Bullinus (Pyrgophysa) forskali* to be the intermediate host of the human parasite, for in an artificial canal their exposure to the attacks of the cercariæ was followed by the development of sporocysts in them.

A very full account is recorded by R. M. Gordon, T. H. Davey, and H. Peaston<sup>3</sup> of experiments using bred snails on the life-cycle and transmission of both *S. mansoni* and *S. hæmatobium* in Sierra Leone, in different villages of which each species was met with alone, probably owing to their recent

infection. *S. mansoni* was found to be most common among adult women, and their cercariae were only found to develop in *P. pfeifferi*, while *S. haematobium* only developed in *P. globosa*. Laboratory animals were infected by exposure to cercariae obtained from the affected snails, and adult worms thus obtained in pure species are minutely described and presented the same characters in both human and animal hosts. The morphology of the cercariae, studied with selective staining for the anterior cephalic glands, also failed to reveal any points of difference. The life cycle and habits of the snails are also described, and both were found more commonly in contaminated native bathing pools. The optimum temperature for the development of the parasites in the snail hosts was investigated in special tanks, and it was found to be 32° to 33° C. for both species, but the development of *S. haematobium* is slower and more influenced by variations of temperature than is *S. mansoni*.

CLINICAL.—The disputed question of the bilharzial appendix is discussed by H. Barsoum,<sup>4</sup> who found the ova in the tissues of this part of the bowel in 28 per cent of all autopsies, but in only 19 per cent of inflamed appendices; so he concludes that the ova are not a cause of appendicitis, which is rare among the highly infected people of Egypt.

TREATMENT.—In view of the claim of A. C. Fisher (see MEDICAL ANNUAL, 1935, p. 377) that *acriflavine*, or *trypaflavine*, orally cured the mild special form of schistosome infections of the Belgian Congo, M. Khalil and M. Salah<sup>5</sup> tested this drug given orally in solution and in capsules and intravenously, and also diamino-methyl acridine and atebirin orally, against *S. haematobium* and *S. mansoni* infections, with entirely negative results. F. G. Cawston<sup>6</sup> reports negative results from the use of neostam in a case of bilharzial disease. In another paper<sup>7</sup> he concludes *tartar emetic* is the only reliable drug in this disease except *emetine*, which is a cardiac depressant in the required course.

REFERENCES.—<sup>1</sup>*Trans. Roy. Soc. Trop. Med. and Hyg.* 1934, xxviii, Nov. 27, 277; <sup>2</sup>*Ann. Trop. Med. and Parasitol.* 1934, xxviii, July 12, 195; <sup>3</sup>*Ibid.* Oct. 19, 862; <sup>4</sup>*Jour. Trop. Med. and Hyg.* 1934, xxxvii, Dec. 15, 387; <sup>5</sup>*Lancet*, 1934, ii, Oct. 20, 865; <sup>6</sup>*Jour. Trop. Med. and Hyg.* 1934, xxxvii, Oct. 15, 316; <sup>7</sup>*Ibid.* Dec. 15, 385.

## SCHOOL MEDICAL SERVICE.

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### HISTORICAL RETROSPECT.

The School Medical Service of this country owes its inception to the general recognition that there were children who, on account of subnormal physique or specific defect, were unable to profit by the education in the ordinary schools provided by the State. Attention was first of all focused on children with very marked defects such as blindness and deafness. Schools for blind and deaf children had been established by voluntary effort as early as the eighteenth century, though it was not until 1893, twenty-three years after the passing of the Elementary Education Act in 1870, which provided for compulsory elementary education for all children, that the State laid the duty on Education Authorities of making provision for blind and deaf children, either by establishing special schools of their own or by sending them to certified schools established by voluntary bodies. A similar power as regards mentally and physically defective children and epileptic children was given by the Elementary Education (Defective and Epileptic Children) Act of 1899, and this power was converted into a duty by the Acts of 1914 and 1918. It is interesting to note that in the Act of 1899 statutory powers in connection with school administration—namely, the duty of ascertaining whether or not a child is defective or epileptic—were for the first time given to a medical officer.

Meanwhile towards the end of the nineteenth century it was realized that, quite apart from those children who, on account of extreme and irremediable defects, needed some form of special education, a large proportion of children in the ordinary schools were prevented from obtaining full benefit from the education provided therein by reason of physical weakness or defect, which for the most part could be remedied. Active interest in the physical welfare of children was being displayed in many parts of the country, and in 1890 a Medical Officer was appointed by the London School Board, an example to be followed by Bradford in 1893. The results of investigations aroused a widespread interest not only in the question of school hygiene, but in the wider question of the national health and the standard of national physique, which was recognized to be dependent in large measure upon the health and physical condition of the children in the state schools. This wider question formed the subject of a report issued in 1904 by the Inter-departmental Committee on Physical Deterioration, which recommended the establishment of a universal system of medical inspection for school children, and the provision of arrangements for the feeding of school children where necessary. This report and others produced abundant evidence of the physical needs of ailing and underfed school children and of the need for a general system of medical inspection, with the possibility of remedial measures. The way was now clear for legislation. In 1906 the Education (Provision of Meals) Act gave power to Local Education Authorities to provide meals for school children, while in 1907 the Education (Administrative Provision) Act required the Local Education Authorities to provide for the systematic medical inspection of all children attending Public Elementary Schools, and empowered them to make arrangements for attending to the health and physical condition of such children.

The immediate purpose of this legislation was to render the ailing child or the child suffering from specific defects fit to receive education, but it is evident that a wider view of the School Medical Service as an agency for the physical and social improvement of the nation was present in the minds of those responsible for the administration of the service. Circular 576, issued by the Board of Education on Nov. 22, 1907, defined the scope and object of the new legislature: "It is founded on a recognition of the close connection which exists between the physical and mental condition of the children and the whole process of education. It recognizes the importance of a satisfactory environment, physical and educational, and by bringing into greater prominence the effect of environment upon the personality of the individual child, seeks to secure ultimately for every child, normal or defective, conditions of life compatible with the full and effective development of its organic functions, its special senses and its mental powers which constitutes a true education."

Before the end of 1908 School Medical Officers had been appointed in 307 of the 328 Education Areas then existing. At first medical work was devoted in the main to taking stock of the position. School Medical Inspection had revealed an enormous amount of physical disability due to defective eyesight, decayed teeth, abnormal conditions of the nose and throat, uncleanness, subnormal nutrition, and a number of so-called 'minor ailments'. The tendency in the earlier stages was to emphasize the need of obtaining treatment through the voluntary hospitals, voluntary organizations, and general practitioner service. Parents were advised, as indeed they are at the present time, to obtain treatment for their children from their private doctors. It became increasingly evident, however, that owing to lack of facilities for treatment, or inability on the part of the parent to afford the services of private practitioners, many children failed to receive the necessary attention. The Authorities found it necessary, therefore, to formulate schemes of treatment for certain

defects, and to establish School Clinics where such treatment could be carried out. This power to provide medical treatment became an obligation under the Education Act, 1918.

Since then progress has been steady and consistent, and to-day each of the 316 Local Education Authorities in England and Wales has a School Medical Service under which medical inspection of school children and the treatment of certain conditions and defects is carried out.

#### THE SCHOOL MEDICAL SERVICE OF TO-DAY.

**1. Staff and Organization.**—The School Medical Service is usually controlled by a Sub-committee of the Education Committee. The administrative head of the Service is the School Medical Officer. He is usually also the Medical Officer of Health of the area, an arrangement which ensures the co-ordination of the School Medical work with that of the Public Health Authority, and one which is advocated by both government departments concerned—namely, the Board of Education and Ministry of Health. On the staff of the School Medical Officers are a number of Assistant School Medical Officers, who may be also Assistant Medical Officers of Health. Acting both in an advisory and executive capacity to the School Medical Service are certain specialists who may include dentists, ophthalmic surgeons, aural surgeons, and orthopaedic surgeons. To assist the medical officers is a nursing staff, the members of which may combine the duties of school nurse with those of health visitor under the Public Health Authority. Finally, for correspondence and records a clerical staff is employed.

**2. Medical Inspection.**—The basis of school medical work is founded on a system of medical inspection of individual children. This system provides that all children of certain specified age groups—namely, entrants, usually aged 5, children aged 8, and children aged 12 in the elementary schools—are examined by a School Medical Officer. The examination takes place in the school. It includes an examination of the respiratory, circulatory, nervous, digestive, and muscular systems, and the special senses. In addition to the inspection of children of specified age groups, known as 'routine' inspections, the medical officers carry out a large number of special examinations of children selected by them, or referred to them by teachers, parents, or school nurses, and of re-examination of children referred as a result of these routine or special inspections. The number of 'routine' examinations in the year amounts to approximately 30 per cent, and the 'routine' and special examinations together amount to approximately 60 per cent of children in average attendance at the elementary schools. The majority of education authorities which are responsible for secondary education have extended the system of medical inspection to secondary school pupils.

Parents are encouraged to be present at the medical examination of their children. They can then be advised concerning the maintenance of the child's health, and be informed of any specific defects which need treatment. The school nurse or, in certain areas, the Care Committee worker 'follows up' children in need of treatment by visits to the home and advises the parents concerning the different agencies from which treatment can be obtained. These home visits are made periodically until the condition is remedied. In the first instance parents are advised to consult their private medical attendant, but should they be unable to follow this advice, then the arrangements for treatment made by the Local Education Authority are utilized.

**2. Schemes for Medical Treatment.**—The nucleus of a scheme for medical treatment is a School Clinic, which is often in the same building as the medical services under the Public Health Authority, e.g., the Maternity and Child

Welfare Service. In all large towns there is a central clinic for various forms of treatment, but in sparsely populated areas the problem of making treatment facilities available is difficult. In some rural areas treatment of certain defects, e.g., minor ailments and dental disease, is carried out in the schools themselves. Certain branches of the work, e.g., the operative treatment of tonsils and adenoids, demand resources which are usually only found in hospitals, and such forms of treatment are provided by arrangements made between education authorities and voluntary hospitals or hospitals under the control of local authorities, e.g., municipal hospitals.

The schemes formulated by most authorities include facilities for the treatment of minor ailments, dental disease, defective vision and eye disease, diseases of the ear, nose, and throat, and orthopædic defects. The treatment of acute illnesses, such as pneumonia and appendicitis, is regarded by the Board of Education as falling within the province of the private medical practitioner and the hospitals, and is not included in Authorities' schemes of treatment.

*a. Treatment of Minor Ailments.*—Under the term 'minor ailments' are included diseases of the skin and ringworm, external eye diseases, and minor injuries such as abrasions and cuts. Treatment prescribed by the medical officer is carried out by the school nurses in the clinic or occasionally in the schools. Many authorities make special arrangements for the treatment of ringworm of the scalp by X rays, which is usually carried out at a hospital under a radiologist.

The function of the Minor Ailment Clinic is, however, not merely to treat the diseases enumerated above. To it are referred all children found at routine inspection to be in need of fuller examination than can be given in the school, and those suspected by parents, teachers, or nurses to be in need of medical attention. Such children may be suffering from general or acute diseases, or defects such as otorrhœa, defective vision, or eye diseases, which need expert attention. They will be examined by the School Medical Officer and referred to appropriate special clinics or other agencies for treatment. The Minor Ailment Clinic may, therefore, be looked upon as the clearing-station of the School Medical Service.

*b. Dental Inspection and Treatment.*—Inspection is carried out in the school by dentists, who are either whole-time officers or are engaged part-time. Treatment is carried out in the School Clinic, where arrangements for the administration of anæsthetics can be made, or, in some rural areas, in the schools. A few authorities have entered into arrangements with dental hospitals for the treatment of orthodontic defects.

The aim of the school dental service is to secure that as many children as possible should leave school without the loss of permanent teeth, free from dental disease, and trained in the care of teeth. To realize this aim every child should be examined annually and treatment given where required. Although but few Authorities are in a position to do this now, dental work is to-day probably the most actively expanding branch of the School Medical Service.

*c. Treatment of Diseases of the Eye and Defective Vision.*—Under the majority of Authorities arrangements are made for specialists to carry out the examination and treatment of cases referred to them. In others this work is performed by School Medical Officers who have had special experience in it.

A test of visual acuity is applied on the occasion of routine medical inspection in the schools. If a child fails at the test, arrangements are made for him to attend the clinic, where examination by refraction and by the ophthalmoscope is carried out. If glasses are needed, they are prescribed and usually supplied

at contract prices under arrangements made by the Education Authority with local opticians. Children with defective vision are submitted to periodical re-examination at the clinic.

*d. Treatment of Diseases of Ear, Nose, and Throat.*—The majority of Education Authorities have schemes for the treatment of chronic tonsillitis and adenoids, which for the most part consist of arrangements made for operations to be carried out by specialists in local hospitals. The more progressive authorities have a properly constituted aural scheme under a specialist, which provides for expert examination and advice for all cases of defective hearing and diseases of the nose and throat, special forms of treatment such as diastolization and ionization, and facilities for hospital treatment of cases needing major operations, e.g., mastoid disease. Too often, however, work under this branch of the School Medical Service is still restricted to the operative treatment of tonsils and adenoids, while conditions such as otorrhoea are relegated to the Minor Ailment Clinic.

*e. Orthopaedic Schemes.*—The nucleus of an orthopaedic scheme is an orthopaedic hospital which may serve a number of Local Education Authorities. As the in-patient treatment of children with certain crippling defects is very prolonged, it is essential, both from a therapeutic and educational point of view, that facilities for the education of children while under treatment should be provided; therefore school teachers are included in the staff of an orthopaedic hospital. Supplementing the work of the central unit are a number of out-patient centres, usually located in the School Clinics and in charge of a visiting orthopaedic surgeon. At these centres massage, remedial exercises, electrical treatment, and general after-care of children who have been discharged from the orthopaedic hospital are carried out. In order to secure continuity in hospital treatment and after-care it is regarded as essential that the visiting orthopaedic surgeon should be on the staff of the parent orthopaedic hospital.

To assist the orthopaedic surgeon the services of a specially trained nurse are required. Her duties are to give massage and other forms of treatment prescribed by the visiting surgeon, and generally supervise all cases coming under the orthopaedic scheme. In addition it is customary for her to hold classes in remedial exercises for children who are suffering from minor orthopaedic defects such as flat-feet, round shoulders, or spinal curvature.

**4. The School Nursing Service.**—Part of the essential framework of a scheme for the inspection and treatment of school children is the school nursing service. The duties of school nurses with regard to 'following up' children found at inspection to be in need of medical treatment have already been mentioned. An equally important though thankless duty is that of ascertaining children suffering from conditions of uncleanness, and, by persuasion or more drastic measures such as exclusion from school, bringing about a reform. In most areas all children are examined by the school nurse three times a year, while individual children found to be in a condition of uncleanness are re-examined at periodical intervals. The improvement in the conditions, as regards cleanliness in clothes, bodies, and heads, of elementary school children which has been wrought during the last twenty-five years is a striking testimony to the efficient and devoted services rendered by school nurses.

**5. Provision of Meals.**—As early as 1906 powers were given to Local Education Authorities to provide meals for children who were unable, by reason of lack of food, to derive full benefit from the education provided. The arrangements for provision of meals became associated with the School Medical Service when this became established. School Medical Officers were expected to refer children showing signs of malnutrition for feeding, to advise on the dietary given in the Feeding Centres, and to exercise general supervision over the feeding

arrangements. The selection of children to attend Feeding Centres was, therefore, partly medical, though more generally it was based on the economic circumstances of the child. During recent years it has been felt that schemes for the provision of meals should be more closely related to the School Medical Service, so as to attain more fully the object for which legislation was framed, which was not the relief of poverty, for which other services exist, but the systematic improvement of the physique and nutrition of school children. Considerable attention is now being paid to the assessment of nutrition and the early detection of children showing very slight symptoms of subnormal nutrition. By means of 'nutrition surveys' by the School Medical Officers children with subnormal nutrition are discovered and referred for treatment by appropriate measures, including the provision of a midday meal, or the administration of milk or cod-liver oil and malt. Valuable help in the campaign against subnormal nutrition has been afforded by the co-operation between the Milk Marketing Board and Local Education Authorities, which has resulted in the establishment of Milk Schemes in the majority of areas. Where such schemes exist, any child may obtain a ration of milk in the school at a reduced price ( $\frac{1}{4}$ d. per one-third pint), while children selected by the Medical Officer as being of subnormal nutrition, and who are not in a position to pay, can obtain it free.

**6. The Special Schools.**—One of the main objects of the School Medical Service is to render children suffering from various defects fit to profit by education in the ordinary schools. There are, however, a few children with severe defects who are permanently unfit to receive education in the ordinary schools. There are other children who are suffering from remediable defects who are temporarily incapacitated from being educated in the ordinary schools, but who, under appropriate treatment at a Special School, e.g., an Open-air School, are rendered fit to take their place in the ordinary school.

The defects which render children permanently unfit for the ordinary school are blindness, deafness, severe mental and physical defects, and epilepsy. Special Schools in which special educational technique is practised have been established for all these types of children.

Though schools for blind and deaf children have been established by Education Authorities, many are still conducted by voluntary bodies though they receive financial support by direct grants from the Board of Education and contributions from the Education Authorities who send children to them. Broadly speaking, the present provision of Special Schools for the blind and deaf is adequate, and in view of the decreasing incidence in blindness and deafness, it seems likely to be more than adequate in the future.

The problem of the mentally defective child has received much attention during recent years. There is at present a substantial body of opinion in favour of making special provision within the general educational system for those mentally defective children who are educable, though there will always be a certain number to whom the conditions of a Special School are necessary.

The number of children requiring admission to Special Schools for cripples has decreased during recent years owing to the decline in surgical tuberculosis, the earlier and more efficient treatment of poliomyelitis, and the development of orthopædic work.

Of the Special Schools meeting the needs of children who are temporarily incapacitated from benefiting by education in the ordinary schools, the Open-air School is the most important. These schools cater mainly for children suffering from debility, anæmia, malnutrition, and those ill-defined conditions of poor health which may be the precursors of more serious illness such as tuberculosis. The majority of Open-air Schools are Day Schools, though a certain proportion are residential. Here a modified school curriculum, based



largely on practical work, is followed, meals are provided, and a definite period is set aside for rest. The majority of children are rendered fit to return to the ordinary schools after periods ranging from nine to eighteen months. Other types of Special Schools to which children are admitted for limited periods, primarily for medical treatment, are Orthopaedic Hospital Schools, Sanatorium Schools for children suffering from tuberculosis, and Hospital Schools for children suffering from rheumatism and heart disease.

The duties of the School Medical Service in relation to the Special School system are to ascertain the children who, on account of defects, need some form of special education, to secure their admission to appropriate schools, and, under Authorities which conduct Special Schools of their own, to carry out the medical supervision of those schools and the children in them.

**7. The Relationship of the School Medical Service to other Social Services.**—So brief a description of the School Medical Service inevitably gives a rather narrow and restricted view of its functions and relationships. It is necessary, therefore, to emphasize that this service is an integral part of the Public Health Service of the country, and that to confer its maximum benefit on the individual it must be intimately related to activities carried out under various Social Services, both public and voluntary. The work of the School Medical Service must be co-ordinated with that of the Maternity and Child Welfare Service, which is concerned with the health of the child under school age. The control of infectious disease in the schools, though primarily a matter for the Public Health Authority, cannot be effectively brought about without the co-operation of the medical officers and nurses working under the Education Authority. The early detection and treatment of tuberculosis in children is dependent on the co-operation between School Medical Officers and Tuberculosis Officers. The treatment service provided by private practitioners and hospitals is a necessary complement to the work carried out by the School Medical Service.

The School Medical Service must also form relationships with certain of the non-medical Social Services. For example, School Medical Officers can give valuable advice to Juvenile Employment Bureaux or Juvenile Advisory Committees with regard to the fitness of children for employment. One important function of the School Medical Officer in the educational service of the country has not yet been mentioned. This can best be described in the words of Sir George Newman as: "To teach and practise personal hygiene in every school, so that a habit of hygiene may be contracted by the children and the way of physiological life may be followed by each coming generation."

#### FUTURE DEVELOPMENTS IN THE SCHOOL MEDICAL SERVICE.

The activities described under the heading, "The School Medical Services of To-day," are undertaken by most Education Authorities and may be looked upon as the minimum requirements of any up-to-date service. Naturally the School Medical Services in different areas vary in detail of organization and in extent of the development of various treatment schemes. The scattered islands round the coast, for example, cannot be expected to have such a fully developed service as that of a county on the mainland, nor can facilities for treatment be so readily offered to a child in a rural county as in a compact and thickly populated county borough.

The scope of ameliorative work tends constantly to widen, and to conclude this survey it might be of interest to mention some of the more important recent developments and to suggest the lines along which future progress will be made. The problem of the rheumatic child has claimed attention during recent years; many Authorities have established centres for the supervision

and treatment of children suffering from this disease as well as for research into its nature; in many areas such work is undertaken in co-operation with the voluntary hospital; further, special hospital schools where children with rheumatism and heart disease can obtain treatment over prolonged periods during which education can be continued, have been provided. Progress in psychological medicine is represented in the domain of the School Medical Service by the establishment of Child Guidance Clinics. Another problem presenting both medical and educational aspects is the correction and eradication of speech defects in children, and many Education Authorities have established special classes for stammerers and children afflicted with other forms of speech defect. Considerable attention is now being directed to the systematic ascertainment of children with slight and unilateral defects of hearing, which has been facilitated recently by the introduction of the audiometer. The more general use of this instrument will tend to focus more attention on the treatment of slight and early cases of deafness which, from the point of view of cure or arrest of further deterioration of hearing, offers the best chance of success.

Investigations into the many problems connected with school medical work will point the way to further progress. By investigation alone will the service be maintained in a healthy, progressive, and virile state. That the spirit of inquiry is active in this field of preventive medicine is shown by the reports on special investigations which appear in the School Medical Officers' Annual Reports, and which form the subject of a chapter in the annual reports on 'The Health of the School Child', published by the Board of Education.

#### STATISTICS FOR 1934.

Some statistics connected with the School Medical Service are given below :—

Number of Education Authorities (England and Wales) = 316.

Number of Children in Average Attendance (1933-4) at Public Elementary Schools = 5,065,963.

#### Medical Inspections.—

Children inspected during 1934 :—

Routine	..	..	1,670,442
Specials	..	..	1,231,663
Re-inspections	..	..	2,006,936

Children found to require treatment at routine examinations (excluding those suffering from uncleanliness and dental disease) = 289,037. 17.30 per cent.

#### Dental Inspections.—

Children inspected by dentists = 3,302,838.

Children found to require treatment = 2,273,508 68.83 per cent.

#### Nurses' Inspections (for Uncleanliness).—

Examinations of children = 16,008,066.

Individual children found unclean = 482,044.

#### Treatment.

			NO. OF L.T.A.'S PROVIDING TREATMENT	NO. TREATED UNDER L.T.A. ARRANGEMENTS
Minor ailments	..	..	312	<i>Defects</i> 886,501
Dental	..	..	314	— 1,431,775
Defective vision, etc...	..	..	315	— 253,707
Tonsils and adenoids (operative)	..	..	287	— 57,683
Orthopaedic	..	..	238	(Volume of work cannot) be shown statistically)

**SCLERODERMA.***A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.*

J. Sellei<sup>1</sup> distinguishes two different conditions in the syndrome which has usually been included under the title 'diffuse scleroderma'.

1. The first, which he calls 'true scleroderma', arises in different parts of the body, and is an infiltrative process which, sooner or later, forms homogeneous patches either circular, ribbon-like, or irregular. The plaques are yellowish alabaster-like, or more rarely bluish-brown in colour, hard, and always are sharply defined indurations. They are always asymmetrical. Pigment changes and vitiligo are frequent. The mucous membranes are not affected, and there are no subjective symptoms. Healing very rarely occurs spontaneously, and in some cases atrophy supervenes, giving rise to white scarred areas. Occasionally there is a shining scale-like development. In rare cases the underlying muscles become involved in the process.

The author believes he has found evidence of functional disturbance of the pancreas in these cases, as shown by a positive reaction to the atoxyl-lipase resistance test. He recommends the following treatment: (a) Raw pancreas, 100 to 200 grm. daily, served at breakfast in warm (not hot) bouillon or mixed with potato purée. (b) Pancreas ferments in the form of tablets containing amylase, lipase, and trypsin (pancrin tablets), to be taken daily on an empty stomach, 3 to 4 an hour before breakfast, 2 an hour before dinner, and 2 an hour before supper. (c) Duodenum extracts in tablet form taken together with pancrin tablets. (d) Liver extracts in tablets or injections in addition. The treatment must be continued for many months.

2. The second form Sellei names 'acrosclerosis', and this arises always on the hands (or feet) and on the face at the same time. The changes are always strictly symmetrical. Vasomotor symptoms (Raynaud phenomena) and subjective symptoms, mainly pain in cold weather, are present. Shrinkage and trophic disturbances are particularly noticeable. On the finger-tips ulcerations and starlike scars appear; the phalanges become sharpened and atrophied; the facial skin taut and rigid; but in spite of the tautness the skin may remain quite soft. The fingers become bent inwards, the phalanges are hard to the touch, but this hardness extends only to the two terminal phalanges (in this way differing from sclerodactylia, which occurs in true scleroderma and extends from the forearm to the back of the hand and thence on to the fingers).

As the disease progresses a mask-like appearance of the face develops; the mouth becomes smaller, the lips are narrowed, and the shrinkage causes the teeth to protrude; the mouth can only be opened with difficulty; eating and swallowing require an effort. The mucous membranes of the mouth, throat, and œsophagus are occasionally involved. Telangiectases are often seen on the face and trunk. The author has frequently found affections of the heart and aorta present. The disease is most frequent in females and does not attack children. Sellei has failed to find evidence of disturbance of the pancreas in these cases, the atoxyl-lipase resistance test being always negative. He has, however, found patients very sensitive to weak solutions of adrenalin.

The disease remains in the same state for decades; myosclerosis and atrophy, however, never supervene. He attributes the disease to some affection of the vegetative nervous system, the direct cause being probably some chemical substance or endocrine gland disturbance.

In treatment, he has obtained the best results with acetylcholine, padutin, muscle and skin extracts, histamine ionization, and ointments. Some cases have improved after sympathectomy.

REFERENCE.—*Brit. Jour. Dermatol. and Syph.* 1934, xlvii, Dec., 523.

**SCURVY, INFANTILE.***Reginald Miller, M.D., F.R.C.P.*

The *Archives of Disease in Childhood*,<sup>1</sup> in honour of Sir Thomas Barlow on the occasion of his ninetieth birthday, has published a special number devoted to infantile scurvy or 'Barlow's disease'.

**HISTORY.**—G. F. Still, in an interesting article on the history of the disease, shows how much had been discovered and forgotten again in the years preceding Barlow's description published in 1883. This communication to the Medico-Chirurgical Society is re-published in full. It was entitled, "On cases described as Acute Rickets, which are probably a combination of Scurvy and Rickets, the Scurvy being an essential and the Rickets a variable element". In this paper the nature of the affection was finally settled by the pathological evidence then brought forward, and in 1894, in his Bradshaw Lecture on "Infantile Scurvy and its Relation to Rickets", Barlow gave a picture of infantile scurvy which left very little to be added by subsequent observers. These two papers established the disease, its symptoms, morbid anatomy, and treatment, for all time. But W. B. Cheadle was the first to recognize the condition as due to scurvy in infants and children, to regard it as a dietetic deficiency disease, and to cure it with orange-juice. His first paper was published in 1878, and was entitled, "Three Cases of Scurvy supervening on Rickets in Young Children". He had had the advantage of seeing much adult scurvy in accompanying the expedition which made the North-West Passage by land, and he was convinced that scurvy was not due, as the sailors thought, to cold or absence of sunshine, but to a deficiency of fresh food. Further, it must be remembered that in those days scurvy was not confined in the young to infants, but intermediate examples between the adult and infantile cases were seen in children. F. J. Poynton contributes a charming article on Cheadle and his work on scurvy.

**VITAMIN C.**—S. S. Zilva writes of the gradual recognition of the anti-scorbutic vitamin and its ultimate identification with ascorbic acid. The synthetic preparation of ascorbic acid which is therapeutically active as an anti-scorbutic supplied the final and incontrovertible proof of this identity, as the ascorbic acid was synthetically prepared from inactive material. Silva discusses the structure and chemical and physical properties of vitamin C. K. U. Toverud has examined the livers of new-born infants for ascorbic acid, and finds that in full-term and premature infants the amount averages 7.01 mgrm. and 6.05 mgrm. per 100 grm. of fresh liver substance respectively. He regards the low content of ascorbic acid at birth as significant for the early development of scurvy in infancy.

P. Rohmer and N. Bezssonoff claim by the use of a test applied to the urine to be able to recognize a condition of lowered vitamin C content preceding the appearance of any clinical signs or symptoms of scurvy, but manifested by wasting, pallor, digestive disturbances, and a tendency to latent infections. They admit, however, that scurvy may supervene without any premonitory symptoms in an infant apparently in a state of perfect health. By estimating the amount of vitamin C excreted in the urine, the authors have come to the conclusion that the appearance of scurvy in an infant is not merely due to lack of the vitamin in the food, but that the inherent function controlling the synthesis of this vitamin has become feeble or disappeared. They conclude that vitamins A and D, and probably the vitamin B complex, have a powerful action upon the biological synthesis of vitamin C.

**SYMPTOMS.**—The manifestations of frank infantile scurvy are well known. Appearing nowadays with great regularity during the second half of the first year of life, they are largely due to hæmorrhage. Bleeding occurs into the gums, under the periosteum of the bones, immobilizing the limbs by pain

(pseudo-paralysis), behind and round the eyes, into the skin, and also from the kidneys. There has for long been some debate as to the reason for the generalized tenderness in certain cases of rickets, and it seems now, with the methods of diagnosis recently used, that this is not a real symptom of rickets but is definitely of scorbutic origin. Most authorities have taught this for many years.

Another point which has been much argued concerns the association between scurvy and anaemia. L. G. Parsons and W. C. Smallwood contribute an interesting article on this question. They conclude that anaemia is a characteristic but not an invariable symptom of infantile scurvy, and that it is due to a deficiency in vitamin C and is curable by a supply of it in adequate quantities. In type the anaemia is usually orthochromic and normocytic; microcytosis, if present, is slight in degree. They believe that vitamin C is required for the maturation of the red cell in all its stages.

DIAGNOSIS.—Mention has already been made of the estimation of vitamin C in the urine and its use as a sign of developing scurvy. With the disease fully developed there is seldom any difficulty in its recognition, except, as has been said in America, that it occurs just rarely enough to permit of its being forgotten. A long and beautifully illustrated article is contributed on the recognition of scurvy by E. A. Park, H. G. Guild, D. Jackson, and M. Bond. It is chiefly concerned with the earliest radiological appearances in scurvy, but the earliest recognition of the disease still rests on the symptoms, particularly on the pain and tenderness of the legs. Any infant, say the authors, known not to have received anti-scorbutic substances over a period of two months, should be suspected of developing scurvy.

TREATMENT.—How far it is an advantage to use *ascorbic acid* rather than orange-juice in the cure of scurvy is doubtful, but it has the advantage of being standardized and cheap, and it can be given by injection as well as by mouth. As regards the amount to be given in scurvy, L. J. Harris and S. N. Ray<sup>2</sup> found that on an average human milk contained 0.056 mgrm. per c.c., and this gives a daily dose to the infant of 30 to 60 mgrm. of ascorbic acid. This has been found to be an effective daily therapeutic dose given orally to an infant of 9 months affected with scurvy.<sup>3</sup> On an oral daily dose of 50 mgrm. A. D. C. Bell<sup>4</sup> obtained marked improvement in an 8-months-old infant within forty-eight hours.

REFERENCES. <sup>1</sup>*Arch. of Dis. Child.* 1935, x, 211; <sup>2</sup>*Lancet*, 1935, i, 71; <sup>3</sup>*Ibid.* 999; <sup>4</sup>*Ibid.* 547.

## SEMINAL VESICLES, SURGERY OF. *Hamilton Bailey, F.R.C.S.*

**Calculi in the Seminal Vesicles.**—Calculi in the seminal vesicles must not be confused with calcification in tuberculous vesiculitis. Seminal vesicular calculi are comparatively rare; when they occur the patient is past 40 and the stones are invariably small and multiple.

**Infected Seminal Vesicles.**—These have been called by some American authors (notably Belfield) 'mule pus tubes'. Honeycombed as the vesicles are with blind recesses and possessing an extremely narrow excretory duct, persistence of infection within them is most understandable. Massage of an infected vesicle may show a normal secretion unless sealed foci are broken open. Such infected recesses, says F. Hinman,<sup>1</sup> serve at intervals to feed organisms into the lymphatic or blood systems to be carried to other regions, such as joints.

S. I. Movitt<sup>2</sup> says that while gonorrhoea is the predisposing cause of seminal vesiculitis, gonococci are rarely present in cases of chronic vesiculitis; they have been displaced by other bacteria. These, in order of frequency, are *Sta.*

*albus*, the diphtheria group, streptococcus, *Sta. aureus*, and colon bacillus. There is usually a mixture of two or more of these bacteria.

Chronic purulent inflammation of the seminal vesicles produces backache similar to the pain experienced by the female afflicted with chronic salpingitis. Not infrequently a chronic seminal vesiculitis obstructs the ureter. Urinary symptoms are in evidence. In the acute stage frequent nocturnal emissions, particularly if blood-stained, are very suggestive of seminal vesiculitis. The key to the diagnosis lies in rectal palpation.

REFERENCES.—<sup>1</sup>*Principles and Practice of Urology*, 1935, Philadelphia, W. B. Saunders Co.; <sup>2</sup>*Urol. and Cutan. Rev.* 1935, xxxix, 564.

## SEPTICÆMIA.

Ivor J. Davies, M.D., F.R.C.P.

D. S. Murray<sup>1</sup> (Richmond, Surrey) submitted a report to the Medical Research Council of a clinical trial of *staphylococcus toxoid*. The demonstration of the production of highly potent toxins by various strains of staphylococci has changed to a large extent the conception of staphylococcal infections, and the further observation that the blood serum in human beings and in animals often contains measurable amounts of the antitoxin has inevitably suggested a new line of attack on these infections. The following are Murray's more important conclusions. The amount of circulating staphylococcal antitoxin is not markedly different in the 'normal' and those with chronic superficial lesions, such as furunculosis. The amount of circulating antitoxin can readily be increased by the injection of staphylococcus toxoid. The increase in circulating antitoxin is associated with clinical improvement in the majority of cases of furunculosis and the other conditions treated in this inquiry. The other conditions included intractable cases of blepharitis of many years standing, and also long-standing cases of acne. The staphylococcus toxoid was supplied by the Wellcome Physiological Research Laboratories.

C. E. Dolman<sup>2</sup> (Toronto) obtained similar favourable clinical results in the use of staphylococcus toxoid, and submits a detailed report of a large series of severe cases of various types of localized staphylococcal infections. Special consideration was given to the significance of staphylococcal infection of the throat, nose, and accessory sinuses; and emphasis was laid upon the probability that in intractable cases of recurrent boils infection may result from auto-inoculation of staphylococci carried in the nose. This investigator also reports on the use of staphylococcus antitoxic serum in the treatment of acute staphylococcal infections and toxæmias. He refers to recent laboratory work on immunization and finds that it clearly supports the main contention of his series of papers, that to confer antitoxic immunity upon a patient by passive immunization with antitoxic serum, and later by active immunization with toxoid, offers the most hopeful and reasonable type of specific treatment at present available for acute staphylococcal infections and toxæmias. These valuable communications deserve the most careful attention from practitioners, as staphylococcal lesions are so common in general practice.

Le Roy D. Fothergill and R. Lium<sup>3</sup> (Boston) have investigated the value of commercial antibacterial streptococcus sera in hæmolytic streptococcus infections. The bactericidal effect of three different commercial hæmolytic streptococcus sera was studied for fifteen different strains of the organism. Essentially no bactericidal power could be demonstrated with them.

Professor F. Cadham<sup>4</sup> (Winnipeg) describes a method of treatment of septicæmia by inoculation of specific antiserum, combined with transfusion of normal human serum. A brief report of 100 cases is submitted; 85 of the patients recovered. Excluding the 5 cases of subacute bacterial endocarditis, all fatal, the mortality-rate of the other 95 cases was 10.5 per cent. The cases under

review covered a period of 8 years and were unselected. The records of the patients with septicæmia, from whom a positive blood culture had been obtained in his laboratory previous to the time covered by the report, showed that the mortality-rate was over 85 per cent. The antiserum was obtained from immunized rabbits.

REFERENCES.—<sup>1</sup>*Lancet*, 1935, i, Feb. 9, 303; <sup>2</sup>*Canad. Med. Assoc. Jour.* 1934, xxx, 601, xxxi, 1, 130; <sup>3</sup>*New Eng. Jour. Med.* 1934, cexi, July 19, 99; <sup>4</sup>*Amer. Jour. Med. Sci.* 1934, clxxxviii, Oct., 542.

### SERUM SICKNESS.

J. D. Rolleston, M.D., F.R.C.P.

SYMPTOMS.—N. Schliesser<sup>1</sup> truly remarks that as a rule the complications of serum treatment, though frequent, are mild in character and usually take the form of urticaria which is localized to the site of injection or more or less generalized. There are, however, rare *atypical forms* (of which the reviewer has not seen an example for many years, though they are apparently not very uncommon in France), such as orchitis, general enlargement of the lymphatic glands, gastro-intestinal symptoms, paralysis and amyotrophy, acute supranuclear insufficiency and sudden death, acute articular rheumatism, and cardiac complications.

J. G. J. Bataille<sup>2</sup> has collected 15 cases in patients aged from 16 to 36, illustrating the occurrence of *paralysis* following the use of diphtheria antitoxin. The dosage of the serum and the sex and disposition of the patient have no etiological importance. Children, however, appear to be immune. Clinically the paralyzes are characterized by their onset with violent pain during the course of typical serum sickness eight to ten days after the injection, by their favourite seat being the root of the upper limb which is innervated by the fifth and sixth cervical roots, and by the association of sensori-motor and amyotrophic changes. Complete recovery is the rule, but takes place very slowly. The diagnosis is based on the history, mode of onset, character of the motor symptoms, early development of amyotrophy, disturbance of electrical reactions, and results of treatment. The most successful method of treatment is calcium or iodine ionization.

TREATMENT.—F. Mercier<sup>3</sup> has found a combination of various *camphosphonates* with *ephedrine* or *sparteine* in intramuscular injections or in the form of lozenges useful for the prevention and treatment of serum sickness.

A. Cléstrate<sup>4</sup> states that the addition of *magnesium hyposulphite* (5 c.c. of a 10 per cent solution) to the serum in cases of re-injection renders Besredka's method of desensitization unnecessary. Intramuscular injections of this drug are also of value in treatment.

REFERENCES.—<sup>1</sup>*Thèse de Paris*, 1934, No. 408; <sup>2</sup>*Ibid.* 1935, No. 3; <sup>3</sup>*Paris méd.* 1934, ii, 437; <sup>4</sup>*Thèse de Paris*, 1934, No. 743.

### SEX HORMONES. (See also PITUITARY BODY.)

Sir Walter Langdon-Brown, M.D., F.R.C.P.

**Pregnancy Tests.**—S. Aschheim<sup>1</sup> regards the Allen-Daisy test for pregnancy by examination of the blood or urine for œstrogenic substances as quite unreliable, while the presence of the gonadotropic hormone in the urine is reliable evidence of pregnancy. He regards it as placental in origin though chemically resembling that from the anterior pituitary, and in support of this view quotes Philipp, who found the implantation of the pituitaries of pregnant women without effect on the sexual maturation of infantile animals. This gonadotropic hormone may be demonstrated in large amounts in the urine only four or five days after a period is due, if pregnancy is the reason for its non-appearance. It disappears within three days from delivery. The value of

the test in the diagnosis of abnormal conditions such as hydatidiform mole or chorionepithelioma has already been referred to in the article on the PITUITARY BODY, but Aschheim states that it is also of value in the diagnosis of teratoma, which will give a positive pregnancy test even in a man. S. L. Cohen and others<sup>2</sup> state that during the greater part of pregnancy, over 99 per cent of the oestrogenic material in the urine is in the 'combined' ether-soluble form which possesses only a low physiological potency. Labour is accompanied and may be preceded by a fall in the combined and a rise in the 'free' form. It is an attractive hypothesis that a factor in the initiation of labour is the interference with the normal mechanism of inactivation, since it is known that injection of free active oestrin into pregnant animals may lead to abortion. R. T. Frank<sup>3</sup> states that the bisexual gonadotropic hormone can be found in small amounts in the blood and urine of children; it brings about the trophic changes at puberty, after which greater amounts are demonstrable. In the healthy adult female a cyclic action of the anterior pituitary is manifested by the cyclic blood and urine curve. After impregnation and throughout pregnancy there is an increase of 100 to 200 times the amount. At the menopause the anterior pituitary cycle ceases, and functional diseases of the female genital tract appear to be due to disturbances of that cycle. No equivalent cycle is found in the male, though oestrogenic substance is found in him, as is a substance apparently identical with the testis hormone in the female.

**Sex Hormone Therapy.**—R. T. Frank and others<sup>4</sup> remain sceptical as to the value of ovarian endocrine therapy as at present practised. They record examples of spontaneous recovery which they consider would account for the majority of the successes currently ascribed to such treatment. C. R. Moore<sup>5</sup> concludes that the gonad hormones are not gonadal stimulants, nor is the product of any specific endocrine gland a stimulating agent for that gland itself. If testis hormone proves to be of value in the clinic it will no doubt find its application, especially in prepubertal castrates. For stimulating greater hormone production in an individual possessing some testis tissue, gonadotropic agents, and not testicular hormone, are indicated.

We must also clearly distinguish between :—

1. *Oestrogenic Therapy.*—E. Novak<sup>6</sup> sums up the present position of oestrogenic therapy thus: It is of little value in endocrinopathic amenorrhoea, but of real though variable value for *menopausal symptoms*. Treatment of *gonorrhoeal vulvo-vaginitis* in children by injection of this hormone is promising, but only further experience can decide as to possible harmful by-effects. Treatment for haemophilia by this method is not living up to early expectations.

2. *Corpus Luteum Therapy.*—G. W. Corner<sup>7</sup> regards progestin as useful in cases of *sterility* or *habitual abortion* due to deficiency of the corpus luteum, but contra-indicated in sterility of ovarian origin. It probably tends to suppress menstruation, so it might be useful in *menorrhagia*. P. M. F. Bishop and others,<sup>8</sup> working with pure progestin, came to more optimistic conclusions. They advise the injection of 1 unit daily for two months, beginning a month before the usual time of abortion. Less than 30 units in all is probably insufficient. In *threatened abortion*, steps should be taken to determine, as far as possible, whether the foetus is still alive. One unit should then be given daily until bleeding and pain have ceased, and the patient should be kept in bed during the treatment. In *functional menorrhagia* one unit should be given daily in the premenstrual phase and during the actual time of the bleeding, while 500 units of the anterior pituitary factor should be injected daily then, and three times a week during two months, apart from these events. For *dysmenorrhoea* one unit should be given daily as soon as pain begins or a day or two before if possible, and continued until the period ceases. For uterine



hypoplasia, with infrequency or absence of menses, they advise 250,000 international units of œstrin (in the form of di-hydro-œstrin benzoate) to be injected on the 1st, 4th, 8th, 11th, and 15th day of the course, amounting to a total of 2,500,000 units. On the 19th to 24th day of the course 1 unit of progesterin is given. Menstrual loss may begin on any day up to 10 days after the last injection. This is known as the 'Kaufmann technique' and should be repeated once. A fortnight later the uterus, which should have been measured before treatment began, is measured again, and except in very severe and long-standing cases, or in primary amenorrhœa, will be found to have increased and may have reached adult dimensions. A drawback to the treatment must be the expense involved.

**Estrogenic Hormones and Carcinogenesis.**—L. Loeb,<sup>9</sup> in discussing the relationship between œstrogenic hormones and carcinogenesis, comes to the following conclusions: (1) There are substances which are both carcinogenetic and œstrogenic; (2) There are substances which have one but not both of these effects; and (3) Even in the first group there is no parallelism between the strength of these two activities. He is further of opinion that there is no essential difference between their relationship and that known to exist between œstrin and calciferol, which he regards as a more or less fortuitous one. The hydrocarbons of tar and the œstrogenic hormones may be more efficient than other factors in producing cancer, but in principle they do not act differently from the numerous other conditions that may cause cancer, following a preliminary period of increased non-specific growth. They seem able to induce the transformation of normal into cancer tissues at any point at which they come into prolonged contact with tissues which still possess the potentiality to grow and proliferate. He maintains that the carcinogenetic effect of the œstrogenic hormone is restricted to secondary sex organs such as the mammary gland.

REFERENCES.—<sup>1</sup>*Jour. Amer. Med. Assoc.* 1935, civ, April 13, 1324; <sup>2</sup>*Lancet*, 1935, i, March 23, 674; <sup>3</sup>*Jour. Amer. Med. Assoc.* 1935, civ, June 1, 1991; <sup>4</sup>*Ibid.* 1934, cii, Aug 11, 393; <sup>5</sup>*Ibid.* 1935, civ, April 20, 1405; <sup>6</sup>*Ibid.* May 18, 1815; <sup>7</sup>*Ibid.* May 25, 1899; <sup>8</sup>*Lancet*, 1935, i, 139; <sup>9</sup>*Jour. Amer. Med. Assoc.* 1935, civ, May 4, 1597.

## SILICOSIS. (See also INDUSTRIAL DISEASES; X-RAY DIAGNOSIS.)

L. S. T. Burrell, M.D., F.R.C.P.

Heffernan<sup>1</sup> states that silica produces a characteristic and definite lesion in the lung which is not caused by other dusts. Coal-miners in Derbyshire do not suffer from silicosis; they may get some blocking of the lymphatics from dust retention, but this is an entirely different condition. He thinks that the importance of pneumoconiosis depends entirely on the proportion of silica it contains. He rejects the mechanical theories that silica particles by their hardness injure the lungs and cause scars or mechanical blocking of the lymphatic vessels, and favours the electro-chemical theory of silicosis. He regards silicosis as nodular fibrosis of the lungs caused by the electro-chemical action of free silica. Silica has electro-chemical activity by virtue of the particles of freshly powdered silica and freshly made hydrosols. Certain mineral silicates, such as asbestos, are also electro-chemically active, but to a less extent. The harmful properties of the silica dusts may be modified by the presence of other dusts.

Gardner<sup>2</sup> regards silica as a tissue poison which produces nodular fibrosis in low dilutions and a rapid necrosis of cells in high concentration. It predisposes to tuberculosis. Non-siliceous dusts do not predispose to tuberculosis, but may cause some fibrosis, and, combined with silica dust, modify the result, and probably lessen the susceptibility to tuberculosis.

REFERENCES.—<sup>1</sup>*Tubercle*, 1935, xvi, 397; <sup>2</sup>*Jour. Amer. Med. Assoc.* 1934, ciii, 743.

**SKIN.** (See also ACNE VULGARIS; CHEIROPOMPHOLYX; DERMATITIS VENEREA; ECZEMA; HEMACHROMATOSIS; LUPUS ERYTHEMATOSUS; ROSACEA; SCLERODERMA.)

### SKIN, FUNGOUS INFECTION OF.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

**Scalp Ringworm.**—G. M. Lewis<sup>1</sup> has treated a series of cases of ringworm of the scalp with a preparation containing 1 per cent *iodine crystals, thymol, and cinnamon oil in petrolatum*. The preparation was rubbed in twice daily after washing the scalp with soap and water. No manual epilation was practised and the cases were observed from time to time by the Wood light. Of 37 patients observed, 13 were cured in from three to twelve weeks. All these cases were due to animal microsporons (*M. lanosum* and *M. felineum*). The remaining 24 cases failed to respond. These were due to *M. audouini*, *Achorion schöenleinii* (Kavusi), and *Tricophyton violaceum*. The author does not claim that the ointment he uses is specific for animal microsporons, but suggests that these animal ringworms respond to local antiseptic treatment more readily than the human species. As the usual treatment by epilation with X rays or thallium is not altogether free from risk, he urges that a differential diagnosis should be made before submitting the child to epilation. For this purpose cultural determination of the fungus is usually necessary, as it is not always possible to determine the nature of the fungus by clinical examination only.

**Ringworm of the Feet.**—A. M. H. Gray<sup>2</sup> points out the frequency of interdigital ringworm of the feet, and discusses the prophylaxis. The first object is to remove all sources of infection. Here two difficulties have to be faced: the failure of the public to recognize mild cases, and the difficulty of obtaining a certain cure. As to the first, it would necessitate compulsory medical examination of the whole population and the education of the medical profession to recognize the disease—conditions which are not likely to obtain in the near future. A great deal, however, may be done to diminish the dissemination of the disease by systematic inspection and treatment in communities, such as public schools, universities, sanatoria, etc., where the disease is known to be prevalent. It is probable that most infection is picked up by the toes from the floor of bathrooms, swimming baths, changing rooms, etc. Two main methods of prophylaxis are available, first by preventing the naked foot from coming in contact with the floor, either by wearing rubber shoes, or by having separate bath-mats for each person; and, secondly, by using some antiseptic after contact with a possibly infected floor. Solutions of 10 to 15 per cent *sodium thiosulphate* and 1 per cent *sodium hypochlorite* have been recommended for this purpose. The author quotes Weidman, who states that the hygiene of the problem is so complicated that he doubts whether the difficulty can be met by this route. He considers that the only method likely to prove of real value is to render the sites where the fungi work undesirable to the fungus.

H. Sharlit<sup>3</sup> has experimented with a number of chemical substances to determine their fungicidal properties, using the chemicals to be tested in a collodion membrane so as to form a lining to the inside of the tubes in which the fungi are cultured. He finds the following remedies satisfactory for clinical use:—

1. For the acute or subacute eczematized form of tinea: (a) Wet dressings of a saturated solution of boric acid, or (b) A 5 per cent boric acid ointment in a hydrophilic base.

2. For the chronic scaling or exfoliating type: (a) Whitfield's ointment until a fair amount of peeling has been achieved, followed by (b) a 5 per cent boric acid salve or dusting powder.

3. For the fissured lesions: a preparation containing salicylic acid, thymol, and tetraedomethenamine, a 1 per cent concentration of each, in flexible collodion.

4. For prophylaxis: (a) A dusting powder made up of boric acid 10 per cent, salicylic acid 1 per cent, and starch 10 per cent, in talc; (b) The collodion mixture described in (3) applied to those fissures which appear in the webs of the toes or fingers, or on the plantar surfaces at the base of the toes.

REFERENCES.—<sup>1</sup>*Amer. Jour. Med. Sci.* 1935, clxxxix, March, 364; <sup>2</sup>*Brit. Med. Jour.* 1934, ii, Sept., 22, 541; <sup>3</sup>*Arch. of Dermatol. and Syph.* 1935, xxxi, Feb., 217.

## SKIN, PYOGENIC INFECTION OF.

A. M. H. Gray, M.D., F.R.C.P., F.R.C.S.

J. Kinnear<sup>1</sup> has examined a series of 176 cases of infective dermatitis, mostly of the retro-auricular type, but including others of the intertrigo and pityriasis-form types, and has in every case cultured an anhaemolytic streptococcus, thus supporting Sabouraud's views as to their etiology. The persistence of these cases, especially of the scalp and retro-auricular regions, is well known, and their resistance to treatment is a source of worry to doctor and patient. Kinnear believes that the difficulties in treatment can be surmounted by a more thorough personal treatment by doctor or nurse, the patient and his relatives being incapable of applying the treatment properly. He has found ointments unsatisfactory, and recommends the application of 1 per cent iodine in spirit. The technique of treatment is as follows: (1) The hair is cut short and kept short. (2) Crusts and scales are removed by boric-starch poultices. (3) The 1 per cent iodine is applied daily. The method of application is important. The first few applications should be made cautiously to establish confidence between nurse and patient, and also because the smarting becomes less as the treatment goes on. The aim should be to rub the solution in as firmly as possible without causing the lesions to bleed. For the folds behind the ears a pledget of cotton-wool is wrapped round a match-stick, dipped in the solution, and rubbed quite firmly into the fold. For the eyes weak zinc-sulphate-boric lotion is probably best. (4) As far as possible the lesions should be left exposed, but at night, and where home conditions are dirty, a light dry dressing may be necessary. No change in treatment is necessary until the cure is complete, except that when the fine dry, scaly stage on the scalp is reached, the poulticing may be stopped, and bi-weekly washing with soap spirit instigated. Where the body is extensively involved, and for the folds such as the axillæ and the groins, the application of a *calamine cream*, slightly carbolized, is often advantageous. It should be applied after the iodine has dried, and must be completely removed each day before re-dressing. It is of extreme importance that treatment be continued till every trace of the disease has gone, or it will surely return. Treatment should be stopped gradually.

J. T. Ingram<sup>2</sup> maintains that this type of case is not primarily a skin infection such as is generally believed. These patients, as a whole, and not only their skins, are particularly liable to infection. Thus, they have infected noses and accessory sinuses, septic tonsils, gingivitis, decayed and septic teeth. They also suffer respiratory and gastro-intestinal infection, but less readily than skin, nose, and throat infections. As part of the constitutional predisposition, there is anæmia, avitaminosis, and general physical debility and malnutrition. It is essential to remember that this is a general and not merely a skin problem, and may call for surgical, dietetic, iron and vitamin, as well as skin therapy. Infective eczema or sycosis may be directly provoked by sinus or mouth infection. This is not a question of septic absorption but of direct local infection. Surgical treatment, generally the opening and drainage of an infected

antrum, is frequently indicated. This may require to be supplemented by general measures to raise the patient's general resistance, such as diet and care of the bowels, iron and vitamin therapy, and general ultra-violet light treatment.

REFERENCES.—<sup>1</sup>*Brit. Med. Jour.* 1935, i, Feb. 16, 291; <sup>2</sup>*Lancet*, 1935, i, April 13, 853.

### SKIN-GRAFTING.

Sir W. I. de C. Wheeler, F.R.C.S.I.

Experiences in connection with traumatic cases, chronic ulcers, and wide breast excisions are recorded by J. V. Goode.<sup>1</sup> He has abandoned sutures to hold large Thiersch grafts in position. Small drops of collodion have been used for this purpose. The graft and surrounding skin are first dried with a piece of gauze. A piece of cotton dipped in collodion is touched to the margin of the graft at intervals of 3 or 4 cm. wherever it overlies the normal skin. The graft is thus sealed and stays adherent for several days. (*Plates LXF, LXVI.*) He recommends small pieces of Thiersch grafts to cover freshly denuded surfaces (*Plate LXVII, C*) instead of pinch grafts (*MEDICAL ANNUAL*, 1930, p. 463). Pedicle grafts or free transplants are employed when the excessive contracture caused by small Thiersch grafts is undesirable. The wound left by

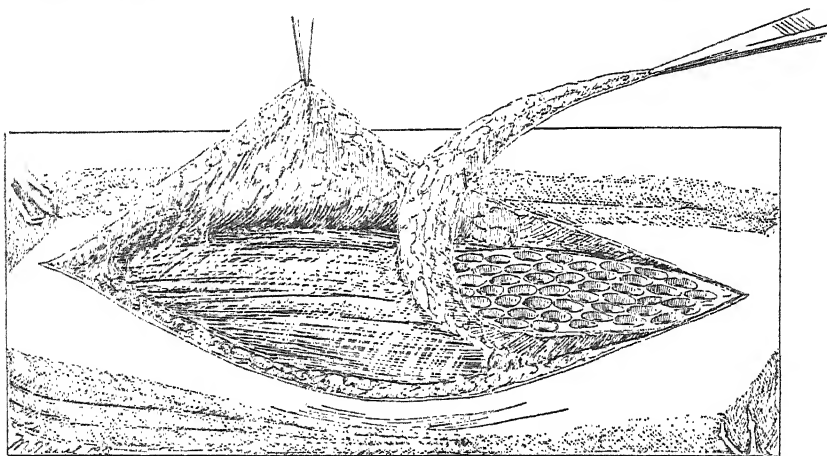


Fig. 62.—Illustrating the removal of the elliptical area from which the grafts were taken and also the necessary undermining of the wound edges in order that closure can be made without undue tension.

the removal of the graft is often more troublesome than the area grafted. Recently the wound has been treated by a 2 per cent solution of *tannic acid* as if it were a burn (*Plate LXVII, D*). The solution is sprayed on every fifteen minutes until a dark brown surface appears. This usually requires two or three hours and can be done in the ward. Nothing must touch the wound until the hard coagulated surface forms. A cradle is placed over the thigh for twenty-four hours to protect the wound from the bedclothes. No dressing is required. The coagulum is separated in about two weeks from the underlying area which is now covered with epithelium. Tannic acid should not be used if fat is exposed, because no tanning takes place. When pinch grafts are employed the denuded area is excised and the resultant edges are sutured (*Fig. 63*). A small but important point in technique is mentioned. If the needle which fixes the small graft during removal is used to carry it to the denuded area, it

*PLATE LXV*

SKIN-GRAFTING

(J. V. GOODE)



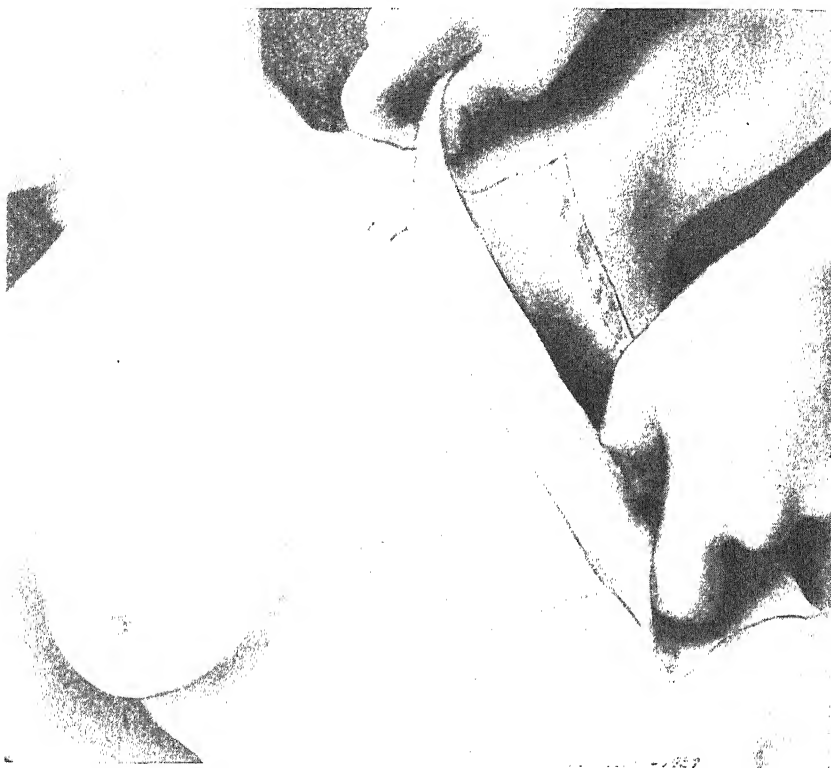
*Fig. A.*—The grafts are fixed by using small drops of collodion placed half on the edge of the graft and half on the surrounding skin.

*Plates LXV-LXVII by kind permission of 'Annals of Surgery*

PLATE LXVI

SKIN-GRAFTING—*continued*

(L. V. GOODE)



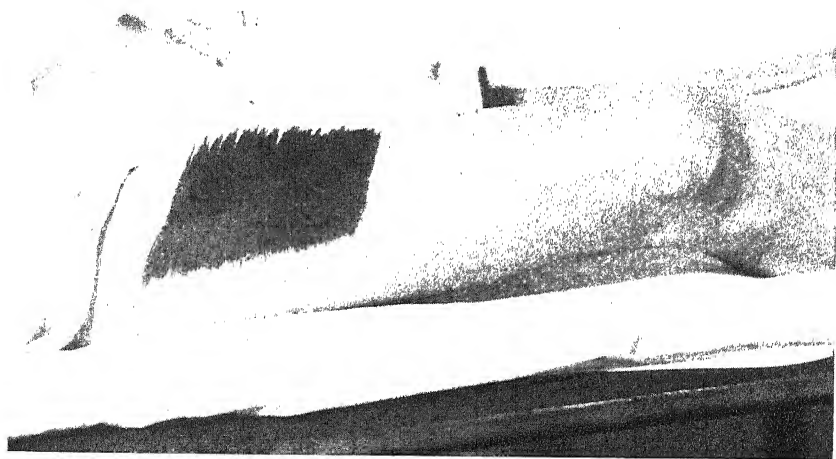
*Fig. B.*—The grafts have been covered with several thicknesses of moist gauze, and the first layer of rubber protective is being applied. The rubber protective should extend beyond the gauze on all sides.

*PLATE LXVII—SKIN-GRAFTING, continued*

(J. V. GOODE)



*Fig. C.*—The small squares of Ollier-Thiersch graft are spaced farther apart than usual.  
Photograph taken one week after grafting.



*Fig. D.*—Photograph of area from which Thiersch graft was removed five days after treatment with 2 per cent aqueous tannic acid solution.





must be passed through a flame before each graft is removed. It is important to keep the area sterile if primary healing after suture is to be expected.

**Homoplastic Skin-grafting.**—The transference of skin from one individual to another is not to be recommended. The subject arises from time to time, and the issue has often been confused by the reports of incomplete observations. H. M. Trusier and H. D. Cogswell,<sup>2</sup> in a concise communication, considerably clarify the whole subject. They state :—

“From our own experience and a critical survey of the literature we are led to believe that most reports of success with homo-skin grafts arise from the fact that these grafts can and often do adhere and appear to grow for several weeks. In our cases, however, such grafts have not remained viable, their ultimate fate being a more or less delayed slough. Healing by cicatrization eventually occurs. These observations are in agreement with recent reports of others. Padgett, however, although in general his observations agree with ours, has reported successful growth in skin transplants between identical twins. The grafts in one such instance were healthy and growing after three months.

“Gillies states that at the present time homografting in general is successful when the transplants involve avascular tissues, notably cartilage and cornea. He admits that homografts of skin, as commonly transplanted, are for all practical purposes unsuccessful. Certainly this is in accord with our experience. It does appear that blood compatibility may tend to favour the initial take of the graft. We have found, however, that ultimately these grafts not only are futile but are detrimental to healing or even dangerous to the life of the host.

“It would seem that homotransplanting of tissues in man, for the most part, fails because of biologic incompatibility, the necrosis that occurs being due primarily to antagonism between the host and the foreign protein of the graft. The infection that may be observed is probably secondary and not the basic cause of the slough. We note with interest the report of Stone, Owings and Gey concerning the successful homoplastic transplantation of glandular tissue by a technique in which the donor's tissue is first transferred to culture *in vitro* with the recipient's serum as a medium. This work is as yet in the experimental stage, but the reports are encouraging.

“The fact remains that, as commonly practised, homografting of skin is useless, deleterious, and unnecessary. Massive destruction of skin is usually due to a burn, and the individual who survives such an injury will have sufficient intact surface to make healing possible with the aid of grafts from the patient's own skin.

“In passing, we wish to emphasize the importance of early skin grafting in the management of such burns. By this procedure much deformity, disfigurement, and suffering will be prevented and lives will be saved. Many severe burns are seen unhealed and septic after many months. In the management of such cases we wish to emphasize the value of ultra-violet therapy as reported by Gatch and Trusler.

“We do not deny the obvious fact that in many cases the homoplastic grafting of skin would be a great help if a practical solution of the problem could be discovered.”

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**SMALL-POX.** (See also VACCINATION.) J. D. Rolleston, M.D., F.R.C.P.

**EPIDEMIOLOGY.**—The following is an abstract of an official publication<sup>1</sup> dealing with the incidence and mortality of small-pox throughout the world in 1933-4. Egypt, in which there were 5697 deaths with nearly 1000 deaths in 1933, was one of the most important foci in Africa. The disease was not

uniformly and simultaneously present in every province, but followed an independent course in each. In 1934 it showed a definite decline, the number of cases in May and June being about a fifth of those reported during the same weeks of 1933. In Central and East Africa there was a progressive decline of the disease in Tanganyika Territory and Nyassaland, where as in the Belgian Congo the number of cases rose considerably, although the mild form predominated. In Morocco the incidence of small-pox has considerably declined, and in Algeria and Tunisia the number of cases remains extremely low. In America small-pox is on the decline both in Canada and in the United States, where the disease is rare in the densely populated states of the north-east, relatively high in the centre and south, and highest in the States of the Pacific and mountain areas. In Mexico, though it is on the decline, small-pox still causes thousands of deaths each year. In Asia, British India, where the number of cases recorded rose from 115,000 in 1932 to 250,000 in 1933, continues to be the principal focus, the increases being due not to any severe local epidemic, but to a general spread of the disease. In China small-pox was frequent at the ports, especially Canton, Shanghai, and Hong Kong, in 1933. An increase in its incidence also took place during the first part of 1933 in Manchuria, Chosan, and Japan. In Persia small-pox incidence was considerably lower in 1933 than in 1932, and in 1934 than in 1933. In Europe the most important foci, as in the previous year (*see* MEDICAL ANNUAL, 1935, p. 393), were Soviet Russia, where the disease was of the severe type but showed a lower incidence in 1933 than in 1932; Spain, where there was a marked fall in the morbidity in 1933 as compared with previous years, and the disease was mostly of the mild type; Portugal, where the mortality rate was 29.4 per cent in 1933; and England and Wales, where only 631 cases were recorded in 1933, and 174 in the first six months of 1934. With the exception of an outbreak of variola major at Blackburn between January and March, 1934 (*see* MEDICAL ANNUAL, 1935, p. 393), all the cases in England and Wales were of the mild type. As in the previous year, there were no cases in Australia, New Zealand, and the Pacific Islands in 1933 or the first half of 1934.

According to the Annual Report of the Chief Medical Officer of the Ministry of Health,<sup>2</sup> the epidemic at Blackburn of 26 cases and 4 deaths was due to handling infected cotton from Egypt.

Another official report<sup>3</sup> states that during the fourth quarter of 1934 only one case of small-pox was notified in England. It occurred in the urban district of Havant and Waterloo (Southampton) and ended fatally. During the third quarter of 1934 there were two cases and in the fourth quarter of 1933 forty-six cases without a death.

**SYMPTOMS AND COMPLICATIONS.**—In a paper on *inherited small-pox*, J. P. Marsden and C. R. M. Greenfield<sup>4</sup> record their observations on 34 cases, which they divide into the following four groups: (1) True congenital small-pox (3 cases), in which the children were born alive at or about full term, and in each case a period elapsed between the onset of the mother's illness and the estimated time of appearance of the rash in the child. (2) Inherited infections, Type A. This group consisted of 8 cases in which infection was acquired in utero, or possibly during separation from the mother, and in each case the child's rash appeared within fourteen days of birth. The mother at the time of delivery was either in the pre-eruptive or early eruptive stage. (3) Inherited infections, Type B (6 cases). In this group the child's rash appeared on the eleventh or twelfth day of life, and in all but one case the child was born at the time of appearance of the mother's rash. (4) Infants born of infected mothers but who escaped congenital infection (17 cases): 4 of these developed small-pox and 13 escaped. The writers' conclusions are as follows: (1) The

bulk of foetal infections are acquired in utero at the time of the mother's septicaemia. (2) If the foetus then escapes, it may become infected during birth, especially if the mother's rash is in the early stage at that time. (3) If the child escapes these two contingencies, it escapes congenital infection, but in the absence of prompt successful vaccination small-pox may develop after the normal incubation period. (4) If the foetus escapes intra-uterine infection and remains in utero until the mother is convalescent from small-pox, it may be born immune, at least temporarily, from the disease. Such children, however, may have survived an intra-uterine attack of small-pox, of which they presented no superficial evidence at birth.

J. P. Marsden<sup>5</sup> reports a fatal case of modified small-pox in a youth aged 17 complicated by *acute perivascular myelinoclasia* or *acute disseminated encephalomyelitis*. Clinically the case was of the fulminant encephalitic type, the nervous symptoms appearing on the eighth day of the eruption. The histological examination of the central nervous system showed the changes peculiar to this form of encephalomyelitis.

**PROPHYLAXIS.**—In a paper on immunity to small-pox, D. Brouwer<sup>6</sup> reports his observations on the number of successful vaccinations of persons who had formerly had small-pox, and found that it was about 13 per cent, from which he concludes that immunity conferred by an attack of small-pox is not permanent. He also describes an immunity reaction whereby persons exposed to small-pox can be released from quarantine in twenty-four hours instead of being isolated for fourteen days. The method is that described by Grubbs<sup>7</sup> which is in use in the New York Quarantine Station and also at Rotterdam. A positive result is indicated by a reaction occurring at the site of vaccination within twenty-four hours and shows that the individual is immune to small-pox.

REFERENCES.—<sup>1</sup>*Epid. Rep. Health Sect. League of Nat.* 1934, xiii, 148; <sup>2</sup>*Amer. Rep. C.M.O. for* 1933, 35; <sup>3</sup>*Bull. Off. internat. d'Hyg. publ.* 1935, xxvii, 803; <sup>4</sup>*Arch. Dis. Child.* 1934, ix, 309; <sup>5</sup>*Lancet*, 1934, ii, 871; <sup>6</sup>*Nederl. Tijds. v. Geneesk.* 1934, lxxviii, 3273; <sup>7</sup>*Public Health Rep.* 1923, xxxviii, 2201.

## SNAKE VENOMS.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

An investigation of Indian cobra venom by K. Venkatachalam and A. R. Ratnagiriswaran<sup>1</sup> showed that doses too small to affect respiration produced after some time motor end-plate paralysis and tonic contraction of all involuntary muscle. Minute doses may revive a heart that has ceased to beat after the administration of aconitine, but there is a gradual diminution of the activity of the venom on keeping. Indian viperine venoms have been investigated by J. Taylor and S. M. K. Mallick.<sup>2</sup> The action of the hæmorrhagin fraction of viperine venoms can be demonstrated by the intradermal injection of a 1-1000 solution, and it is found to be proportionate to the toxicity of the whole venom, and the sera made from *Daboia*, *Echis carinata*, and the *Bitis arietans* of South Africa will each neutralize the hæmorrhagin of all three. Nevertheless, when the hæmorrhagin fraction has been neutralized the toxicity of the venom is not decreased, showing that the hæmorrhagin is not the main cause of their deadliness, although its neutralization would be likely to lessen the late hæmorrhages following bites. In a further paper the same workers<sup>3</sup> report on the coagulant action of viperine venoms, which they find only to be neutralized by the specific antivenins for each, and not by those of each other as in the case of hæmorrhagins. The cross-action of antivenins of Indian and African colubrine and viperine venoms is reported on by E. Grasset and A. Zoutendyx.<sup>4</sup> They found that strong solutions of both the Indian *Daboia* and cobra venoms can be detoxicated and converted into anavenoms by the same methods as used in the case of South African venoms, and they retain their powers of immunizing animals. The antivenins made from *Daboia* and *Bitis arietans* venoms are

dissimilar and have no appreciable neutralizing effect on each other, and the same remark applies to those of South American anti-rattlesnake and African puff-adder sera, but the Indian and South African cobras are more closely allied and a moderate degree of group action has been found in their case. The more rapidly produced sera with the aid of formalized anavenoms were as potent as those made from unmodified venoms. M. L. Ahuja<sup>5</sup> has tested the power of antivenin prepared from Indian and South African cobras against the venoms of each, and found that they neutralize both the lethal action and the hemolytic effects of both venoms. H. E. Shortt and S. M. K. Mallick<sup>6</sup> have found that snake venoms can be detoxicated very rapidly by the photodynamic action of methylene blue, preferably in a strength of 1-50,000, but they thereby lose their antigenic powers, so are useless for preparing antivenin.

(See also BLOOD DISEASES—TREATMENT OF HÆMORRHAGIC DIATHESIS WITH SNAKE VENOM.)

REFERENCES.—<sup>1</sup>*Ind. Jour. Med. Research*, 1934, xxii, Oct., 289; <sup>2</sup>*Ibid.* 1935, xxiii, July, 121; <sup>3</sup>*Ibid.* 131; <sup>4</sup>*Trans. Roy. Soc. Trop. Med. and Hyg.*, 1935, xxviii, Jan., 391; <sup>5</sup>*Ind. Jour. Med. Research*, 1935, xxii, Jan., 479; <sup>6</sup>*Ibid.* 529.

### SPIDER BITES.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

In California, according to J. M. Frawley and H. M. Ginsburg,<sup>1</sup> during the last seven years 52 cases of black spider bite (*Latrodectus mactans*) have been treated at the Fresno hospital. The usual patient is an adult male bitten on the penis or scrotum while using an out-door privy, with resulting severe pain and swelling, with a cramped and spastic condition in the extremities, nausea or vomiting, dizziness, and a blood-pressure raised by some 35 mm. The abdominal wall may be tender and rigid. No deaths occurred in this series, although they have occasionally been reported, chiefly in children, who suffer from convulsions. Alcohol is contra-indicated, as fatal results have followed its use, but morphia is of value. Bogen and others have advised the intravenous use of 10 per cent *magnesium sulphate*, and this treatment was given by the writers (after the application of iodine to the bite and the injection of morphine sulphate and sodium amytal) in doses of 20 c.c. of a 10 per cent solution, repeated until the hypertension and spasticity of the muscles was relieved, with good results.

E. W. Gilbert and C. W. Stewart<sup>2</sup> also report on cases of this condition seen at the Los Angeles hospital, and mention that the disease has been met with in thirty-two States, chiefly in the southern U.S.A., and also in Australia. These writers found morphine to be of little use, and also doubt the value of magnesium sulphate injections, nor has the serum of convalescent patients proved effective. The active principle of the venom has not yet been isolated, but it is believed to act on the myoneural junctions, so they used *calcium chloride* intravenously in 20-c.c. doses of a 10 per cent solution, or better *calcium gluconate* in 10-c.c. doses of a 10 per cent solution, and in children intramuscularly, and claim immediate and prolonged relief was afforded by this treatment.

REFERENCES.—<sup>1</sup>*Jour. Amer. Med. Assoc.*, 1935, civ, May 18, 1790; <sup>2</sup>*Amer. Jour. Med. Sci.*, 1935, clxxxix, April, 532.

### SPINE AND SPINAL CORD, SURGERY OF. (See also JOINTS, SURGERY OF.)

Geoffrey Jefferson, M.S., F.R.C.S.

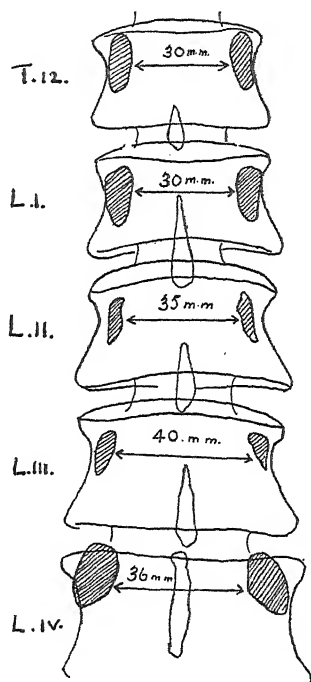
#### SPINAL TUMOURS.

Whilst everyone is familiar in some degree with the symptomatology of spinal-cord tumours, knowledge increases little by little on the special effects of one or the other kind of tumour. The most important auxiliary aids to

*diagnosis* have come undoubtedly from the examination of the cerebrospinal fluid and the mechanical exploration of the subarachnoid space by manometry and lipiodol. The increase in albumin and globulin which occurs in the presence of a spinal tumour has been well recognized for many years, whilst Queckenstedt's test has now established fully its position as a valuable, but not infallible, aid to diagnosis. Lipiodol is now freely used in most neurological clinics for the precise localization of a lesion. It may further have a place in differential diagnosis, but the better the clinician the less need for it, except as an immediate pre-operative step in order to ensure exposure of the tumour through a limited laminectomy.

In some cases help can be obtained from the examination of the plain X rays of the spine (*Fig. 64*). C. A. Elsberg and C. G. Dyke<sup>1</sup> point out that the localized pressure of a spinal tumour may result in changes in the bony walls of the vertebral canal. They had observed that in the normal spine the inner borders of the pedicles in antero-posterior röntgenograms are ordinarily convex. Accurate measurements of the interpedicular distance can be made from the 5th cervical to the 5th lumbar vertebra. Enlargement of the canal was found by these authors in 42 per cent of 67 cases of spinal-cord tumour, and in 70 per cent of 20 cases where the tumour lay somewhere between the 10th thoracic and 5th lumbar vertebrae. They emphasize the fact that this enlargement is recognizable only on measurement, so that the films must be very carefully studied. The alteration is more apt to happen in tumours of the lower reaches of the spinal canal. In the mid-thoracic region pathological increase in size was far more frequent in extradural than in intradural tumours. Besides this increase in interpedicular distance another change is sometimes recognizable—decrease in the height of the pedicle because of extension of the tumour into the intervertebral foramen.

Lambert Rogers<sup>2</sup> has excellently reviewed the surgery of spinal-cord tumours in a Hunterian Lecture based on 25 personal cases, of which only 3 were intramedullary. He emphasizes the difficulty of differential diagnosis in some cases, for 5 of his own have been thought to be suffering from disseminated sclerosis, and stresses the importance of re-assessing a case if the symptoms are definitely progressive. He refers to the painlessness of some spinal tumours, for the clinician is often led astray by the teaching that all spinal tumours cause severe root pain, and this is by no means universally true. The fact is that root pain occurs most characteristically with the mobile tumour of the posterior root (neurofibroma) which is capable of movement by the cerebrospinal fluid. This mobility often leads to severe pain on movement, and to sharp crises if the patient coughs or strains when he



*Fig. 64.*—Drawing from a skiagram of a case of the reviewer's, showing thinning and stunting of the pedicles caused by a tumour of the cauda equina.

sends a pressure wave from the cranial cavity down along the cord. The common meningioma which is firmly attached to the dura is less likely to be associated with obtrusive pain. The most difficult case is the neurofibroma arising from a root of the cauda equina, because owing to the mobility of the other nerve-roots clear-cut neurological signs are often late in appearing and a patient may have an unexplained fixed pain for a long time before a correct diagnosis is arrived at. In one of the present writer's own cases such a pain had existed for ten years. Diagnosis is greatly helped by examination of the cerebrospinal fluid, and this should always be done in difficult cases. Lambert Rogers mentions the power of recovery of the cord after removal of the tumour, and has found more rapid recovery after removal of quickly growing tumours. When the tumour has grown very slowly the regression is often very slow. He has found it very difficult to say from the appearance of the cord to what extent recovery of conduction will occur, because severe indentation and tape-like flattening are not necessarily incompatible with complete recovery.

Urinary tract infection is a serious bar to rapid recovery, and J. F. Connors and I. E. Nash<sup>2</sup> have discussed the management of *urological complications in paraplegia*. Their material is traumatic rather than neoplastic, but the problem is similar in both conditions. There is no doubt that in spinal fracture with injury to the cord, urinary infection is the most important contributory cause of death. The essential pathological factors are loss of motor bladder innervation with poor emptying and stagnation of urine. Most of the infections are produced by catheterization, although it is now recognized that auto-infection may occur. Connors and Nash have tried intermittent catheterization, suprapubic cystotomy, and manual expression, but the mortality statistics continued at the usual high level, because at one time or another catheterization had also been employed. Finally they decided that the only policy was to leave the patients severely alone and never to catheterize. In 54 cases treated since they laid down the rule that no distended bladder was to be catheterized, the results have been greatly improved. The plan adopted is this. If the patient fails to empty his bladder within a reasonable time manual expression is tried. This almost always succeeds in expressing some urine. They have found that stimulation by means of the "mass reflex" of Head and Riddoch has never succeeded in their hands in emptying the bladder, but they are speaking, of course, of the immediate post-traumatic state. Manual expression is carried out every four to six hours by orderlies and nurses. They believe that it must be resorted to before distension becomes too marked. If the patient is left too long, manipulation is too painful. In cases where there is no discomfort—and they find that the most usual state—the bladder is allowed to go on distending until overflow occurs. They have waited twenty-four to thirty-six hours or more and finally the bladder emptied. They have never seen a bladder rupture from over-distension, and they cannot find such a case in the literature. Once the bladder has succeeded in voiding by overflow they find that it will continue to do so for several weeks until automatic control is established. Special care must be given to prevent the formation of bed-sores. They occurred in only one case in their series. In only two cases had they to resort to suprapubic cystotomy, either because manual expression was not instituted early enough or because it was too painful. These two cases did well. (*See also JOINTS, SURGERY OF—PARAPLEGIA IN POTT'S DISEASE.*)

#### HERNIATION OF NUCLEUS PULPOSUS (CHONDROMA).

W. J. Mixter and J. S. Barr<sup>4</sup> describe 19 cases of compression of the spinal cord or the cauda equina by herniation of the nucleus pulposus through a rupture in the intervertebral disc (*Fig. 65*). This paper and one by Max

Peet and D. H. Echols<sup>5</sup> are thoroughly important contributions because they mark the recognition of a new pathological entity. For many years past cases have at times been described in which the cord has been compressed anteriorly by what was thought to be a chondroma originating in the intervertebral disc. In 1925 G. Schmorl<sup>6</sup> began a routine examination of the vertebræ and intervertebral discs by autopsy on persons dead from any cause. This work was furthered by R. Andrae,<sup>7</sup> Calvé, and by O. A. Beadles<sup>8</sup> in our own country. It is now recognized that the nucleus pulposus may escape from the intervertebral disc in abnormal conditions such as degeneration or traumatic fissure of the annulus fibrosus. The nucleus, which is always under pressure, herniates through the defect, and the direction will depend on the position of the fissure or defect. If it is in the cartilaginous plate above or below the disc, the herniation occurs into the vertebral body; if it is behind, the nucleus prolapses into the vertebral canal. This has been established by experimentation on dogs. Elsberg, in his classical monograph on 100 tumours of the spinal cord, refers to 14 cases in which he found nodules attached to the disc as examples of chondromata, but he remarked that the material histologically corresponded to the nucleus pulposus, and thus the condition must have been in reality identical with the prolapse found by Schmorl in about 15 per cent of the spines examined by him. The herniation usually occurs to one or the other side of the posterior longitudinal ligament. Histologically there is nothing neoplastic in their structure.

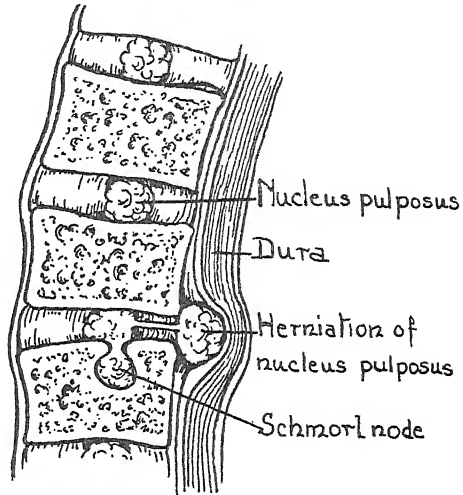


Fig. 65.—Herniation of nucleus pulposus compressing cord. (After Peet and Echols.)

In the investigation of the series of cases from the Massachusetts General Hospital, Mixter and Barr emphasize the difficulty in diagnosis in this type of lesion. Operation has often been delayed on account of the indifferent nature of the symptomatology and its similarity to that found in various other conditions, such as back strain, arthritis, spinal osteo-arthritis, and sacro-iliac strain. The symptoms naturally depend on the level and on the size of the lesion. There is often a history of trauma, but it is not immediately antecedent, as a rule, to the onset of symptoms. If the lesion is high there are the usual signs of mild cord compression with spasticity, and as time passes a sensory level develops. The most difficult cases are those in which the herniated nucleus compresses the cauda equina, and it is these which are often mistaken for what the orthopædists call "low back strain." The diagnosis can often only be established by lumbar puncture and examination with lipiodol. The protein in the cerebrospinal fluid was raised in all of their 19 cases (lowest 37, highest 204 mgrm. per cent; in 13 cases out of the 19 it was less than 87). Queckenstedt's test showed a partial block in 12 cases, in 2 no block, in the rest the block was complete. X-ray examination of the spine often showed nothing of great consequence. Narrowing of the disc is

the most important finding, particularly if the superior and inferior surfaces of the vertebral bodies are abnormally concave. In this series 4 cases were cervical, 4 thoracic, 11 lumbar and lumbo-sacral. Spastic paraplegia and even complete paralysis of the lower limbs, with incontinence, was sometimes seen, and on the whole there was very definite evidence of neural damage in these cases. The majority of the patients are males. Rather less than half give a history of trauma.

Mixer believes that the type of operation performed is important, so that it is an advantage to suspect one of these lesions beforehand. He does a limited laminectomy, making only a narrow opening on the side of the lesion so far as that can be foretold. He believes that a ruptured disc is a weakened disc and the strength of the spine should be preserved. After opening the dura the spinal canal is carefully explored, paying particular attention to the intervertebral disc in front of the cord and the intervertebral foramina. If the lesion is found at or near the mid-line, the dura over it is incised. If it is lateral, the dura is closed and the tumour dissected out extra-durally from the side. The tumour may be very small and difficult to find if it occurs close to the intervertebral foramen. Once found, its removal is usually simple, for it may come away without tedious dissection. If not, it is cut across at its base or curetted. Mixer suggests that the bone-chips should be preserved and fitted into the stumps of the laminae before closing the wound, to facilitate fusion. He thinks that the disc herniations can be easily differentiated macroscopically from true chondromata; the latter are lobulated and almost transparent, whilst the disc nodules can be unrolled and flattened out "like a crumpled bit of wet blotting paper."

Two further cases are very well described by Peet and Echols. In the first case the tumour arose from the disc between the 2nd and 3rd lumbar vertebrae. The cerebrospinal fluid was xanthochromic and Queckenstedt's test indicated a complete spinal block. This patient had been confined to bed for three months previous to admission, and there was no history of trauma.

In the second case the history was of one year's soreness and weakness of the arms and difficulty in walking. There were weakness and spasticity of all four extremities with a positive Babinski on both sides. Impairment of sensibility to light touch and pin-prick reached as high as the 4th cervical segment. Lumbar puncture showed partial block, and X-ray no abnormality of the vertebrae or discs. At operation a yellowish white nodule was found anterior to the dura attached to the intervertebral disc between the 3rd and 4th cervical vertebrae and extending to the right of the mid-line. On incising the capsule cartilaginous material was spontaneously extruded. Both cases made a good recovery.

COMMENT.—The new pathological entity deserves wide recognition. The symptoms and signs presented by these cases suggest a spinal-cord tumour because of the very gradual but progressive unfolding of the symptoms. The most difficult cases are those in the lumbar region and lumbo-sacral junction, and there is no doubt that many of these cases must miss diagnosis for lack of a really competent neurological examination, and are treated symptomatically as cases of low backache or sciatica. Fortunately lumbar puncture will usually set the clinician thinking along the right lines, for the albumin content of the cerebrospinal fluid shows an increase in albumin and there may be a block on testing by jugular compression. The tumour is not always easy to find at operation, and familiarity with the correct method of looking for a spinal-cord tumour is essential. Once found, the tumour is not particularly difficult to deal with.



It is worth while to emphasize one more point, that all the cases referred to above had definite signs as well as symptoms. Thus Mixter and Barr's statement that the cases clinically resembled osteo-arthritis and back-strain can be considered only partly true, for quite a number of their cases had an obtrusive degree of paralysis or sensory loss in addition to pain in the back.

(See also X-RAY DIAGNOSIS—BONES AND JOINTS.)

#### SYRINGOMYELIA.

The question of the operative treatment of syringomyelia has been discussed before (see MEDICAL ANNUAL, 1933, p. 471). There have recently been two important contributions on the subject. A. Jüzelevskij<sup>9</sup> analyses 23 cases treated by the method which has become known on the Continent as the *Puusepp's operation*, that is, by cervical laminectomy, incision of the dura, and opening of the cavity in the cord by an incision through one of the posterior columns. The 23 cases had characteristic syringomyelic symptoms. Three of them had signs of bulbar involvement (syringobulbia). Several times an attempt was made to fill the syringomyelic cavity with lipiodol so as to show its extent before operation. This was successful three times and the lipiodol was shown on the X-ray picture as an intramedullary shadow. Jüzelevskij gives a brief summary of the 23 cases served by himself at the Bechterev Institute in Leningrad. All of these patients survived operation, although on 6 occasions there was trouble with wound healing, as has been found to be characteristic of this disease. As a result of the first 6 of these cases operated upon Jüzelevskij was enthusiastic about the results of operation in reducing spontaneous pain, improving muscle power, and lessening the extent of the anæsthetic zones. As the result of his now more extensive experience he is very sceptical about the value of the operation, for he has observed that after a primary period in which distinct improvement is noticed, there is a return to the former state, even at the end of fourteen days, and in the rest within a few months. In only one case was the condition improved at the end of five years, and in that case, he adds, the condition was very little dissimilar from that before operation. These observations are based not only on his own 23 cases but on 81 additional cases collected from the literature (104 in all).

To this number must be added the Liverpool series of Henry Cohen and R. E. Kelly<sup>10</sup> (10 cases). The results of this series were identical with those of Jüzelevskij, and the opinion can now be arrived at that the operation, in spite of the enthusiasm of a surgeon here or there, can offer nothing of importance to the syringomyelic. It appears likely that rest, the withdrawal of the patient from work or his profession, has an effect approximately equal to the operation. Jüzelevskij has made observations on the pressure within the syringomyelic cavity and in the cerebrospinal fluid at the same level and finds that they are the same. This being so, the idea of the Puusepp operation in relieving tension within the cord is seen to be without a firm basis in observed fact.

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**SPLenic ANÆMIA.** (See BLOOD DISEASES.)

**SPRUE.***Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

**TREATMENT.**—The use of *liver extracts and protein diets* continues to find favour in the treatment of sprue. Intensive use of liver extract is advised by C. P. Rhoads and D. K. Miller,<sup>1</sup> of New York. They point out that Baumgartner applied the procedure of Minot to the treatment of the pernicious anæmia of sprue, and liver, meat and milk diets, as well as liver extracts, are followed by an increase of the reticulocytes in the blood. The common factor in these treatments is probably the water-soluble vitamin they all contain, and it is probable that a deficiency of that vitamin is an important element in the causation of some cases of sprue. Studies of pernicious anæmia show that liver extracts are effective in the anæmias of sprue, so they are indicated as well as the vitamin-containing diets. As Castle showed that normal gastric juice acts on beef muscle to form a third substance of value in pernicious anæmia, a deficiency of gastric juice in sprue predisposes to the development of pernicious anæmia and this indicates the use of liver extracts. For supplying water-soluble vitamin, extract of yeast is of value, for when this is incubated with gastric juice and fed to pernicious anæmia patients reticulocyte increase and improvement of the blood follow, although neither yeast nor gastric juice was effective alone. Still more effective is the injection of small amounts of liver extracts containing the product of the action of gastric juice on the vitamin, as absorption may be deficient after oral administration. The parenteral administration of liver extract is thus indicated in severe cases, and examples of its value are illustrated by four patients refractory to other treatment.

N. H. Fairley<sup>2</sup> dealt once more with sprue treatment at the British Medical Association meeting, and he records two series of cases to show that very similar results were obtained by the use of liver extract combined with either high protein diet or with Sprulac, the latter being much simpler to administer, provided the liver extract is administered in adequate amounts. He also found the hæmatological response to the oral administration of liver extract quite satisfactory in most cases, so that parenteral use is rarely required, but in exceptionally resistant cases it should be injected in large doses in addition to its oral use. When the gastric juice is deficient in acid, dilute *hydrochloric acid* may be given in 30- to 60-min. doses thrice daily. With the present more efficient treatment patients under 55 may be permitted to return to the tropics after recovery. G. E. Brooke<sup>3</sup> in a general account of sprue, mentions that he found pancreatized Peptalac of Cow & Gate more effective in the disease than Sprulac of the same firm. He also advocated cream cheese as an article of diet in this disease.

REFERENCES.—<sup>1</sup>*Jour. Amer. Med. Assoc.* 1934, ciii, Aug. 11, 387; <sup>2</sup>*Brit. Med. Jour.* 1934, ii, Dec. 29, 1192; <sup>3</sup>*Jour. Trop. Med. and Hyg.*, 1935, xxxviii, Feb. 1, 29.

**STAMMERING: RE-EDUCATION OF THE STAMMERER.***H. Devine, M.D., F.R.C.P.*

H. St. John Rumsey<sup>1</sup> points out that during the last ten years the treatment of stammering by psychotherapy has undoubtedly proved satisfactory in a large number of cases; but there is a vast number which can never yield to this type of treatment alone, because the stammering characteristics are so firmly fixed in the motor memory that nothing but the correction of these can effect satisfactory results and permanent freedom from the disability.

Stammering is a lack of co-ordination between the speech organs; to be more accurate, a lack of automatic co-ordination. In place of automatic co-ordination there is an intermittent failure of the larynx to produce vocal

tone. The larynx is the mainspring of speech, so the first step must be to establish conscious control of the larynx and to practise this control so persistently that a new and correct motor memory is established; then automatic control will naturally follow.

This system, which may be termed 'correction by elocution', is based on the widely realized fact that stammerers, if musical, can sing fluently. This is because, when singing, the stammerer is subconsciously thinking in terms of vowels, but when speaking he is thinking in terms of consonants. Any singer will agree that certain vowels are easier to sing than others, but any stammerer will assert that he finds certain consonants harder to make than the others.

So we start off with the fact that automatic co-ordination is present when the stammerer sings, but it is lacking intermittently when he speaks, and that correct motor memory is controlling his song. This being so, the next step must be to ascertain what the stammerer does when singing which he does not do when speaking. As stated above, it is a matter of thinking in vowels or thinking in consonants—in other words, the singer's voice tone (which is heard principally in the vowels) is smooth and continuous throughout the musical phrase, while the consonants are secondary. The stammerer's method is to speak in jerks with exaggerated consonants, and when in difficulties to accentuate these characteristics further, until his speech consists of a series of explosive consonant articulations with the vowels 'clipped', even to the extent of a total cessation of voice-flow until the word is eventually forced out. To use common musical words, the stammerer's speech is *staccato*, while that of the rhythmic speaker (like song) is *legato*. If the stammerer will re-educate his speech on musical lines, a stammer will become impossible.

A common habit of the stammerer is to relapse suddenly into vocal silence while the consonant is articulated again and again. The best way to cure this habit is to concentrate the attention on a mental picture of the voice tone, or what may be called 'the tune' of the sentence; in this way a correct motor memory will be acquired to take the place of concentrated attention to consonants.

Speech is produced by co-ordinated muscular movements just as much as the throwing of a cricket ball; in the latter case a mental picture is made of the completed throw, and the muscles do the rest; just as surely a mental picture of the voice tone will produce it.

We are not bi-vocal; speech and song are produced by the same muscles. What we can sing we can speak if we realize the close relation between song and speech. If the stammerer will think of flowing vocal tones when speaking, as he does when singing, he cannot fail; but in many cases the habit of thinking on wrong lines is so firmly established that only consistent practice on the lines of 'vocal tone speech' will build up a correct habit to take the place of the wrong one.

Nearly all stammerers speak too fast, and nearly always come of quick-speaking parents; this leads to the idea that stammering is inherited, whereas the connection is merely that rapid speech opens the door for the stammer, which may develop after an illness, shock, strain, or by association with another case.

Lastly, prevention is better than cure, so attention should be paid to the speech of children. If by stammering we mean stumbling over words, then nearly all children are stammerers while they are learning to speak, but only 1 or 2 per cent of them become conscious of failure, anticipate more failure, and so develop into what we call nervous stammerers. The remedy is obvious: the child should be taught that slow, firm, and smooth speaking is more musical

than the quick, jerky, squeaky speech we generally associate with young children. There is no logical reason why children should not be taught from the first to speak properly, with musical rhythm; if this were done, stammering could never develop.

REFERENCE.—*Med. Press and Circ.* 1935, exo, May 8, 438.

### STAPHYLOCOCCAL INFECTIONS. (See also SEPTICÆMIA.)

J. D. Rolleston, M.D., F.R.C.P.

**SYMPTOMS AND COMPLICATIONS.**—J. H. Rabinovici,<sup>1</sup> who records an illustrative case in a man, aged 50, states that *staphylococcus septicæmia* may assume any form from a fulminating attack which proves fatal in twenty-four hours to a protracted illness which may last with intermissions for years. An attack with an acute onset is not necessarily fatal, but may take on a protracted course. The secondary localizations in the bones or joints may occur at a late stage and be very extensive from the first, with a tendency to necrosis without suppuration, and to last for a considerable time. Treatment usually consists, according to the type of arthritis, in puncture, arthrotomy, or resection, but sometimes lesions of the joints and bones may be cured, even if they are very extensive, by immobilization alone.

According to P. Boridoux<sup>2</sup> the *pulmonary localizations* of staphylococcal septicæmia may occur in the form of pseudo-bronchopneumonia, large circumscribed abscesses, massive hepatization, sero-hæmorrhagic pleurisy or empyema, and pneumothorax. In spite of their variety they present the following features in common: (1) A minimum of functional signs, which accounts for their escaping recognition unless the chest is examined; (2) A tendency to subside even in the case of extensive lesions.

An outbreak of four fatal cases of *staphylococcus pneumonia* among infants in a maternity hospital is reported by C. M. Smith.<sup>3</sup> Within the previous fortnight an infant had died from a phlegmonous abscess, 3 mothers and an infant had suffered from suppurative mastitis, and among the infants there had been an unusual prevalence of minor septic skin lesions, and 6 cases of mastitis were discovered among 55 mothers. With the possible exception of the phlegmonous abscess, all these cases were regarded as different manifestations of staphylococcal infection. W. W. Anderson and D. F. Cathcart<sup>4</sup> report a case of primary staphylococcal pneumonia in a boy, aged 6 years, complicated by empyema, septicæmia, multiple abscesses, and osteomyelitis of the skull and second right metacarpal bone, in which recovery took place.

In a thesis on *staphylococcal myositis*, M. Goulet,<sup>5</sup> who records 22 cases in patients aged from 5 to 61 years, states that *Sta. aureus* is by far the most frequent organism to give rise to myositis, as in 51 out of Abrami and Worms' 63 cases. The introduction of the staphylococcus may be due to all kinds of lesions of the skin, mucous membranes, bones, or cellular tissue infected with this organism. The lower limbs are almost exclusively affected. Although the prognosis may be very grave, it is usually favourable, as all but two of Goulet's cases recovered, and depends on the patient's resistance, the degree of virulence of the micro-organism, and most of all on its subsequent localizations. Treatment is mainly surgical.

J. E. Dunlap<sup>6</sup> reports a case of *staphylococcal meningitis* with recovery in a boy aged 8 years following an injury to the left knee and lumbar spine. Treatment consisted in copious spinal drainage by lumbar puncture twice daily and early administration intraspinally of *Sta. aureus* bacteriophage.

A. W. Borowicz,<sup>7</sup> who reports three cases in patients aged 18, 23, and 25 years, one of which ended fatally, states that *primary staphylococcus abscess of the liver* is extremely rare. The diagnosis is very difficult when there is no

obvious portal of entry for infection as in Borowicz's case. Operation may sometimes effect a cure, but in most cases death occurs owing to the progress of the infection rather than from hepatic insufficiency.

In view of the rarity of the staphylococcus being a cause of *primary peritonitis*, the case recorded by R. S. Melville<sup>8</sup> is of interest. The patient was a girl aged 6 years, in whom the possibility of pneumococcal peritonitis was first considered, but a diagnosis of perforated appendix was made before operation. On laparotomy straw-coloured fluid escaped and generalized peritonitis was found. The appendix was injected, but was obviously not the cause of the peritonitis. A swab from the peritoneum yielded a pure culture of *St. aureus*. Staphylococci were also recovered from the appendix together with *B. coli*. Recovery took place.

TREATMENT.—C. E. Dolman<sup>9</sup> found a *staphylococcus toxoid* of controlled potency exceedingly useful in the treatment of 306 cases of various types of localized staphylococcal infection, including 81 cases of recurrent furunculosis, 59 patients with subacute or chronic osteomyelitis, and 42 cases of acne vulgaris. D. S. Murray<sup>10</sup> reports his observations on 116 patients, aged from 6 weeks to 12 years, suffering from various staphylococcal diseases in whom no lasting benefit had been derived from various other forms of treatment who were given staphylococcus toxoid. Increase in the circulating antitoxin was commonly associated with an improvement in the clinical condition. The injections were attended with very few severe reactions. The best results were obtained in pure staphylococcal infections, and acne did not improve to any extent. J. I. Connor and M. McKie<sup>11</sup> treated 36 cases of superficial staphylococcal infections in patients aged from 16 to 56 by injections of staphylococcus toxoid. Complete cure or considerable improvement took place in every case.

REFERENCES.—<sup>1</sup>*Thèse de Paris*, 1935, No. 45; <sup>2</sup>*Ibid.* No. 265; <sup>3</sup>*Lancet*, 1935, i, 1204; <sup>4</sup>*Amer. Jour. Dis. Child.* 1935, xlix, 1276; <sup>5</sup>*Thèse de Paris*, 1935, No. 98; <sup>6</sup>*Jour. Amer. Med. Assoc.* 1935, civ, 1594; <sup>7</sup>*Thèse de Paris*, 1934, No. 62; <sup>8</sup>*Lancet* 1935, i, 1329; <sup>9</sup>*Ibid.* 306; <sup>10</sup>*Ibid.* 303; <sup>11</sup>*Brit. Jour. Dermatol. and Syph.* 1934, xlii, 20.

## STERILIZATION.

Beckwith Whitehouse, M.S., F.R.C.S., F.C.O.G.

The medical and legal aspects concerned in the sterilization of women formed the subject of a recent combined discussion at the Royal Society of Medicine and the Eugenic Society.<sup>1</sup> There is no doubt that this discussion was timely, since at the present time, with changing and varying standards of natural conduct, not only is lay but also medical opinion somewhat nebulous regarding the basic problems of legality and indications.

Cecil Binney<sup>1</sup> expressed the legal view that in Great Britain there is no law directly forbidding sterilization, that the operation, if carried out *for the preservation of the patient's health*, is perfectly legal. This does not imply, however, that *all* sterilizing operations are necessarily legal. Consent of the patient cannot be utilized as a defence to a charge of "unlawful wounding" if no adequate indication for sterilization is present. Since sterilization necessarily involves in most cases the infliction of a wound, the practitioner who sterilizes a patient without proper indications lays himself open, therefore, to a possible indictment for "maiming" or "wounding with intent", even if consent has been obtained.

Operations for sterilization on eugenic grounds provide an intermediate case between obviously legal and probably illegal acts. Binney inclines to the view that so-called 'eugenic' mutilations are not legal, not because the law has any prejudice against eugenics, but because it will not usually look so far into the ultimate results of an act *prima facie* criminal! With regard to mental defectives, the letter of the law is at present quite explicit. The

author notes that since to sterilize a person without her consent is a crime, it must be a crime to sterilize a person who has not the intelligence to consent. Furthermore, should such an operation be performed upon a person of weak intellect *other than for purposes of her own health*, it might easily be construed as an offence under the appropriate sections of the Lunacy and Mental Deficiency Acts, which forbid the "ill-treatment" of such individuals. Binney sums up the present legal position in this country in the following words: "A sterilizing operation may be lawfully performed for the patient's health. To perform one without adequate reason is most probably an offence; whether to perform one for eugenic reasons is forbidden or not, remains doubtful, except that in the case of lunatics and mental defectives it is illegal."

Victor Lack<sup>1</sup> discusses the possible medical indications for sterilization under the following groups:—

*Group 1.*—Diseases which invariably run a downhill course and which, in spite of periods when the condition remains stationary, all reduce the natural expectation of life. Under this heading are included chronic rheumatic carditis, chronic nephritis, diabetes, and some nervous diseases, e.g., disseminated sclerosis.

*Group 2.*—Certain diseases which approximate to the former group, but from which recovery is theoretically possible, e.g., pulmonary tuberculosis and hyperthyroidism.

*Group 3.*—Mental diseases, including epilepsy. The author specially cites the case of a woman who previously had puerperal insanity and again became pregnant. He considers that under such circumstances the uterus should be evacuated and the patient sterilized.

*Group 4.*—Obstetrical and gynaecological indications, e.g., in cases of pelvic contraction necessitating repeated Caesarean section, or after radical plastic operations for the cure of uterine or pelvic floor prolapse.

*Group 5.*—Hereditary diseases. Under this heading Lack includes such transmissible diseases as hæmophilia, and acholuric familial jaundice.

In view of the considered legal opinion expressed above, it appears rather doubtful whether all the indications which the author cites are permissible. During the last five years sterilization has been carried out at the London Hospital upon 65 patients, an average of 13 patients per annum. The indications for the operation include the following list of diseases: heart disease (20), contracted pelvis (19), chronic nephritis (6), mental disease (4), epilepsy (3), hyperthyroidism (3), "bad obstetric history" (2), rheumatoid arthritis (1), pulmonary tuberculosis (1), prolapse (1), osteomalacia (1), after "colporrhaphy" (1), afternephrectomy and *B. coli* pyelitis (1), hyperpiesis (1), kyphosis (1).

REFERENCE.—<sup>1</sup>*Proc. Roy. Soc. Med.* (Sect. Obst. and Gynecol.) 1935, xxviii, May, 951.

**STOMACH.** (*See also* GASTRIC; GASTRITIS.)

### STOMACH, LYMPHOGRANULOMA OF.

*H. Letheby Tidy, M.D., F.R.C.P.*

Theodore Thompson and L. H. Howells<sup>1</sup> (London) report 4 new cases of the rare localized primary lymphogranuloma of the stomach. Lymphogranuloma, or, as it is often called, 'lymphocarcinoma', may occur either as an isolated primary lesion or in association with involvement of other tissues throughout the body. The local lesion is important as there is evidence that partial gastrectomy is often followed by good results. The authors found only 13 cases in the literature in which a localized lesion was present in the stomach. In 9 of these partial gastrectomy was successfully performed, while 4 others

died after the operation. Histologically, the differentiation from Hodgkin's lymphogranuloma is very difficult. The clinical symptoms suggest either neoplasm or ulcer, and it is this which commonly leads to exploratory operation. Thompson's cases were all operated upon, and all recovered from the operation. One case died eleven months later, but the other three cases were still alive without a sign of recurrence.

REFERENCE.—<sup>1</sup>*Quart. Jour. Med.* 1935, N.S. iv, Jan., 81.

### STOMACH, SURGERY OF. (See also GASTRIC AND DUODENAL ULCER.)

A. Rendle Short, M.D., F.R.C.S.

**Hypertrophic Pyloric Stenosis in the Adult.**—R. F. Elmer and C. E. Boylan,<sup>1</sup> of Chicago, describe a case in a man of 68; the history was quite recent. He did well after a Rammstedt operation. A few similar cases are on record.

**Carcinoma of the Stomach.**—Donald C. Balfour,<sup>2</sup> of the Mayo Clinic, says that if only the resection can be done while the growth is still confined to the stomach, half the patients are alive and well after five years. A rectal examination is important, as one of the first metastases to appear is usually in the pouch of Douglas. Apart from the supraclavicular lymph glands, extra-abdominal metastases are rare. A moderate degree of anæmia is no bar to successful operation. The presence or absence of free HCl is of little or no value in the diagnosis, as it is often present in cases of cancer. If the growth cannot be removed, exclusion, by cutting the stomach across and joining the proximal portion to the jejunum, gives better results than gastrojejunostomy.

Verne C. Hunt,<sup>3</sup> of Los Angeles, says that the number of patients apparently cured of cancer of the stomach by gastrectomy varies in different clinics from 4.8 to 33 per cent (Lahey's Clinic) of patients seen. The death-rate of gastrectomy, usually about 30 per cent, has been brought as low as 10 in 200 cases by Balfour, greatly assisted by careful pre-operative feeding, lavage, and blood transfusions. Probably about 20 per cent of the patients who survive operation are alive and well five years later.

F. H. Lahey, N. W. Swinton, and M. Peelen<sup>4</sup> discuss a series of 195 cases of cancer of the stomach treated between 1927 and 1934. Though there is no characteristic early symptomatology, there is nearly always dyspepsia, pain, or anorexia. Modern X-ray diagnosis is very accurate, 95 per cent, but it ought to be used much more frequently and earlier. The mortality of total gastrectomy, 7 cases, was 57 per cent; of subtotal gastrectomy, 34 per cent. The authors have given up spinal anæsthesia; in their experience the best anæsthetic is intratracheal ethylene with regional field block with metycaine. One patient survived total gastrectomy four years. Of the partial gastrectomy cases, 11 were alive, 4 after more than three years. Palliative operations carry a high mortality and do not prolong life.

In an effort to sort out the more from the less hopeful cases, A. O. Whipple and T. S. Raiford,<sup>5</sup> of New York, observe that fungating growths give a better end-result than ulcerating or infiltrating cancers. The presence of enlarged lymph glands should not contra-indicate resection; they are not necessarily malignant.

American statistics are much more plentiful than British, but five surgeons at St. Thomas's Hospital<sup>6</sup> have collaborated to present the results of treatment of 149 cases between 1920 and 1932. Of these, 122 were too far advanced for excision; only 9 lived for a year, and the average duration of life was only 3 months. Of the 27 patients treated by gastrectomy, 9 died. The average duration of the survivors was eighteen months. Four patients survived three years, but apparently none are now living. It is not a cheerful picture.

[I have one patient alive and well after sixteen years, and another after four years.—A. R. S.]

At the Mayo Clinic, it is thought well worth while to attack even quite large growths, as they are often less malignant than small ones. More stomach can be safely removed if the gastrojejunal anastomosis is made before the stomach is cut across, and a jejunal stoma permits early feeding before healing of the suture-line is sound (W. Walters<sup>7</sup>).

*Perforation of Cancerous Ulcer.*—Eight cases are reported from Edinburgh Royal Infirmary, over ten years, by Ian Aird.<sup>8</sup> Usually the picture closely resembles that of perforated peptic ulcer, but occasionally there is a singular absence of rigidity. In other cases the perforation is more or less silent. About 40 per cent have been saved by operation; sometimes a gastrectomy has been practicable (7 cases in the literature). [I have seen a recovered case in which subsequently cancerous nodules developed all over the peritoneal cavity.—A. R. S.]

*Sarcoma of the Stomach.*—G. T. Pack and G. McNeer,<sup>9</sup> of New York, reporting 9 cases, say that sarcomata comprise 1 per cent of all gastric tumours. They are practically indistinguishable from carcinomata either clinically or by X rays, but a horizontal filling defect is suggestive, also the persistence of gastric peristalsis. In lymphosarcoma there may be a lump but no gastric symptoms at all. The results of treatment are better than for cancer. Three of the patients, all lymphosarcomata, did excellently on X-ray therapy, or a radium pack. For other types of growth partial gastrectomy is indicated.

REFERENCES.—<sup>1</sup>*Amer. Jour. Surg.* 1934, Sept., 499; <sup>2</sup>*Surg. Gynecol. and Obst.* 1934, Sept., 453; <sup>3</sup>*Ann. of Surg.* 1935, May, 1200. <sup>4</sup>*New England Jour. Med.* 1935, May, 863; <sup>5</sup>*Surg. Gynecol. and Obst.* 1934, Sept., 397; <sup>6</sup>*Lancet*, 1935, i, 1059; <sup>7</sup>*Jour. Amer. Med. Assoc.* 1934, Nov., 1345; <sup>8</sup>*Brit. Jour. Surg.* 1935, Jan., 545; <sup>9</sup>*Ann. of Surg.* 1935, May, 1206.

## STREPTOCOCCUS INFECTIONS. J. D. Rolleston, M.D., F.R.C.P.

*EPIDEMIOLOGY.*—In their paper on the recent wave of streptococcal infections, H. L. Wallace and A. B. Smith<sup>1</sup> have drawn up a graph showing the incidence of notified scarlet fever and erysipelas and hospital cases of acute rheumatism in the city of Edinburgh during the period 1929 to March, 1934. During 1933 and the first quarter of 1934 there was a marked increase in the number of cases of acute rheumatism and acute streptococcal endocarditis coincidentally with an exceptionally large epidemic of scarlet fever. They suggest that the effect of an unusually hot dry season on a highly susceptible community was a factor in producing the wave of streptococcal infection.

*SYMPTOMS.*—According to R. P. Delecluse,<sup>2</sup> *streptococcal venous septicæmia* may be secondary to an infection such as influenza, tonsillitis, or otitis, or be caused by trauma. Several veins may be affected at the same time. Recovery is delayed, and does not take place until the end of four or five months. The diagnosis is made by a blood culture taken during an acute attack. It is not always positive, so that it is important to wait for a rise of temperature before taking the culture. The prognosis of streptococcal venous septicæmia appears to be better than that of septicæmia without a venous localization. Local treatment consists in immobilization of the affected part; in some cases surgical intervention may be required, while the general treatment is that of streptococcal septicæmia.

J. Felsen and A. G. Osofsky,<sup>3</sup> who record a personal case, have collected 57 cases of recovery from *streptococcal meningitis*. The onset usually follows an infection of the upper respiratory tract. The organisms isolated are both the hæmolytic and non-hæmolytic types and *Str. viridans*. The authors' case was that of a man aged 22 who developed meningitis following a lacerated



wound of the scalp. Smears of the turbid cerebrospinal fluid showed cocci and a Gram-positive bacillus suggestive of the anaerobic group: 5 c.c. of anti-gangrene serum were therefore given intrathecally, and the dose was repeated the same day. Much improvement ensued, and two more doses were given, with the result that rapid recovery took place. Further bacteriological examinations showed *Str. viridans* in pure culture.

**DIAGNOSIS.**—J. H. Mitchell<sup>4</sup> deprecates the tendency to regard all dermatoses of the hands and feet as due to ringworm, and records four cases in which this error was made and the remedies appropriate for ringworm were applied without success. The lesions, however, rapidly cleared up on discovery of their streptococcal origin and the use of sublimate baths and applications of weak ammoniated mercury ointment.

**TREATMENT.**—L. M. Reimhold<sup>5</sup> reports ten cases of streptococcal or staphylococcal septicæmia in the form of acute osteomyelitis or puerperal fever in patients aged from 12 to 27 treated by intravenous injections of *colloidal copper*. The injections should be given as early as possible in doses ranging from 5 to 20 c.c., which should be repeated daily or every two days according to the severity of the general condition, and should be continued for four or five days after the temperature has fallen, so that the total duration of treatment is about ten days.

G. Marcu<sup>6</sup> states that in otogenic streptococcal septicæmia the first indication is to destroy the local focus of infection and then to inject *Vincent's anti-streptococcal serum* in doses of 100 to 120 c.c. for adults and 80 to 100 c.c. for children until at least two days after the temperature has become normal.

**REFERENCES.**—<sup>1</sup>*Lancet*, 1934, ii, 1391; <sup>2</sup>*Thèse de Paris*, 1935, No. 35; <sup>3</sup>*Jour. Amer. Med. Assoc.* 1934, cii, 2170; <sup>4</sup>*Ibid.* 1935, civ, 1220; <sup>5</sup>*Thèse de Paris*, 1934, No. 766; <sup>6</sup>*Ibid.* 1935, No. 285.

## SUBACUTE COMBINED DEGENERATION OF THE CORD. (See ANÆMIA, PERNICIOUS.)

### SUBPHRENIC ABSCESS.

A. Rendle Short, M.D., F.R.C.S.

W. A. Hailes,<sup>1</sup> of Melbourne, contributes a good article based on 10 personal cases, of which 8 recovered and 2 died. He points out that doming up of the diaphragm, as shown by X rays, may be a misleading sign; in one of his patients it was present, perhaps as a result of phrenic nerve paralysis, but there was no pus under the diaphragm. He suggests that when pus has been found by the aspirating needle in the right posterior subphrenic space, the needle should be re-inserted lower down to find the lowest level of the pus, so that the abscess may be opened by the transthoracic route but below the pleural reflection if possible. The operation of drainage is best carried out with novocain anaesthesia; 4 in. of rib should be resected. If necessary to shut off the pleura, the diaphragm must be sewn to the lateral thoracic wall, not to the periosteum but to the intercostal muscles. Two-stage operations waste valuable time.

**REFERENCE.**—<sup>1</sup>*Austral. and N.Z. Jour. Surg.* 1934, July, 3.

### SUBPHRENIC ABSCESS IN CHILDREN.

John Fraser, Ch.M., F.R.C.S.Ed.

The occurrence of subphrenic abscess in children is a rare event. Small groups of cases have been reported in literature from time to time, but the complication is undoubtedly infrequent, and there is considerable interest therefore attached to a paper on this subject by J. Ireland.<sup>1</sup> Six cases form the basis of the report, and the age of the patients ranged from 14 months to 12 years. In every instance the subphrenic collection was secondary to a

pre-existing infection: in 4 instances there was a preceding acute appendicitis, in 1 a perforated gastric ulcer, in 1 a lobar pneumonia. The clinical course of the disease is very similar to that encountered in adults, and no useful purpose is served by a detailed account of the symptoms. The real interest of the question lies in the origin of the abscess. In one instance (*Case 3*) it appeared subsequent to a lobar pneumonia, and it is likely that the collection appeared as the result of a lymphatic extension through the diaphragm. In the second instance (*Case 2*) it appeared to be of the nature of a residual or 'rest' abscess, the result of a general peritonitis. But in the remaining 4 cases, all of them secondary to appendix infections, it is probably significant that in 3 of them (the records of the fourth are indefinite) the appendix was *not* removed at operation because it is stated that pus was present. Now, the importance of the position is this—that to permit a heavily infected appendix to remain *in situ* is to incur the risk of an ascending lymphatic infection, which, extending by the lymphatics which lie behind the cæcum, may ultimately give rise to a subphrenic infection. This point is not brought out in Ireland's paper, but it appears to us a most significant possibility.

The methods of treatment employed followed the well-accepted procedure. Three of the cases were drained through the anterior abdominal route, while three were drained posteriorly by the transpleural route. The author brings out a point of practical importance in regard to the maintenance of drainage over a long period of time; in one instance it was continued for 118 days. It is believed that by this means the risks of recurrence are lessened.

REFERENCE.—<sup>1</sup>*Surg. Gynecol. and Obst.* 1934, lix, Nov., 789.

## SWIMMING BATHS AND HEALTH.

G. E. Oates, M.D., M.R.C.P., D.P.H.

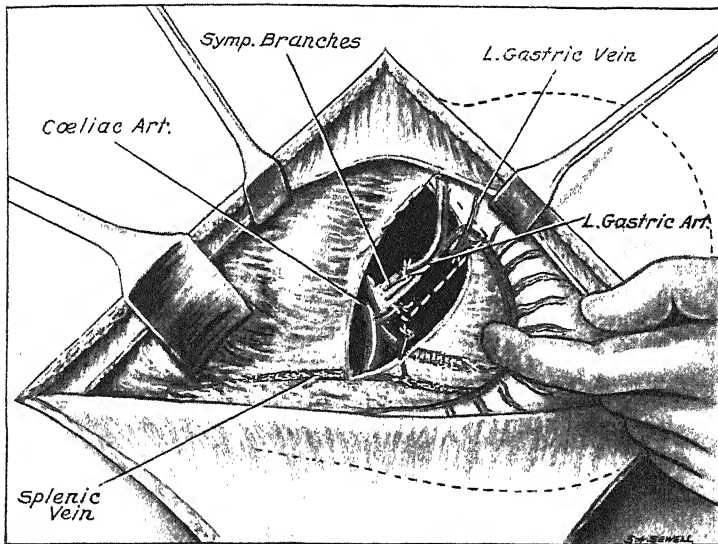
Great improvements are taking place in the condition of public swimming baths. Firstly, more care is taken to prevent the introduction of dirt. *The Lancet*, discussing a number of points of interest,<sup>1</sup> suggests that bathers should not reach the undressing rooms by walking along the edge of the bath, and that they should have some means of cleansing the skin, and especially the feet, before entering the water. This can be done by making them pass on their way to the bath under a shower of sterilizing water and through a trough filled with similar water. As some do not like cold showers, it may be advisable to have this water warmed. The best way of cleansing the feet is by means of a spray which impinges on a raised platform on which the foot can be placed; this is likely to clean the spaces between the toes. Having regard to the effect of cold water on the urinary excretion it is desirable that urinals should be situated on the way to the bath, and that children should be required to use them before going into the bath.

The treatment of the water is the second consideration. Small baths can be kept in tolerable condition by simple chlorination, either with chloride of lime, or more conveniently with a solution of sodium hypochlorite such as Chlorox, if care is taken to add so much as will maintain a suitable excess of free chlorine. The free chlorine content should be kept up to 0.2 to 0.5 parts per million by daily additions. This requires daily testing of the water. If the upper limit is not exceeded, the water is unlikely to irritate the eyes, and if the lower limit is not reached, sterilization is likely to be unsatisfactory. The water will not remain clear for prolonged periods, and must be changed before it becomes so turbid that the bottom of the bath at the deepest part is invisible. Without filtration chlorination is but a makeshift, at best only securing sterility of the water and effecting some economy in its use. The only satisfactory treatment is filtration after coagulation, followed by sterilization of the clarified

PLATE LXVIII

SYMPATHECTOMY FOR CARDIOSPASM

(G. C. KNIGHT)



Operation: double subcostal incision. The left lobe of the liver has been mobilized and retracted to the right. The lesser omentum has been incised and the left gastric vein divided. The left gastric artery is divided at its origin. The portion of tissue to be excised is included in the white frame.

*By kind permission of the 'British Journal of Surgery'*



water. After removing gross impurities by straining through a coarse-netted grid, there is added to the water as it leaves the bath a small proportion of a soluble aluminium salt, followed by an alkaline solution. The precipitated aluminium hydroxide will separate with it, either mechanically or by coagulation of colloids, the fine matters in suspension which cause turbidity, as well as those in quasi-solution, in a state removable by filtration through sand. The clear water which passes from the filter contains only matters in solution and bacteria which have not been removed by the previous processes.

The most commonly used agent for sterilizing is chlorine, but where an electric supply is available the use of ozone or of ultra-violet rays is worthy of consideration. Ozone has been largely used on the Continent for sterilizing drinking-water. The residual dose can be adjusted so that there is only the merest smell of the gas, which is not unpleasant. Ultra-violet light can be used successfully to sterilize clear, well-filtered water, and is effective when none of the water flowing past the lamp is more than 12 in. from it and the exposure lasts at least four seconds. It is easy to use a much smaller working distance than this.

(*See also* CONJUNCTIVA, DISEASES OF—SWIMMING-BATH CONJUNCTIVITIS; SKIN, FUNGUS AFFECTIONS OF.)

REFERENCE.—<sup>1</sup>*Lancet*, 1934, i, 1363.

## SYMPATHETIC NERVOUS SYSTEM, SURGERY OF.

*Geoffrey Jefferson, M.S., F.R.C.S.*

**Sympathectomy for Cardiospasm.**—Cardiospasm is, of course, a diagnosis, and not a description, of a clearly defined organic lesion, for it is the rule that however severe the obstruction may have been, post-mortem never reveals an obstruction distal to the dilatation. Variable lengths of the lower portion of the œsophagus may go into spasm, the most common level being at the diaphragm. G. C. Knight<sup>1</sup> discusses the current theories of pathogenesis. Knight has himself shown experimentally that a portion of the œsophagus which passes through the diaphragm and its short intra-abdominal portion can function as a true intrinsic sphincter which is relaxed by the vagus and contracts on sympathetic stimulation. The sympathetic supply comes from the celiac plexus in fibres which follow the course of the left gastric artery and its œsophageal branch. He has demonstrated further that excision of the vagal branches reproduces the X-ray and pathological clinical picture of achalasia of the cardia, the sphincter failing to relax. These results were permanent. If, however, both thoracic sympathetic chains were excised at the same time, no obstruction resulted. Denervation of the sympathetic fibres supplying the cardia resulted in a complete loss of sphincter tonus, so that a meal could be caused to regurgitate from the stomach into the œsophagus, and although some tone was recovered later there was always an abnormally rapid passage of a swallowed bolus into the stomach. Animals which had had experimental achalasia induced by vagal section were cured by a subsequent celiac sympathectomy. Knight mentions three cases operated upon by W. A. D. Adamson at Edinburgh and reports three cases operated upon by Professor G. E. Gask. The left gastric artery is excised from its origin to the termination of the œsophagus and gastric branches (*Plate LXVIII*), but for the exact technique the original paper must be referred to. Provided that the case has been correctly chosen and is a true example of nervous imbalance, this operation seems likely to prove the most successful yet devised for this troublesome condition.

**Denervation of the Adrenal Glands.**—George Crile,<sup>2</sup> in a short paper, sets out his views on the indications for the operation of denervation of the

suprarenals which has been thought to have a place in the treatment of hypertension, hyperthyroidism, peptic ulcer, and possibly diabetes. Crile states that in established cases of *hypertension* the end-results of adrenal denervation are negative, but that in young subjects it may help to stabilize the condition at a lower level. But these results on the whole have been disappointing. For *hyperthyroidism* 79 operations on the adrenal gland have been performed—11 removals, and 68 denervations. Crile claims improvement or cure in 100 per cent. There has been an average gain in weight of 20 lb. contrasted with a pre-operative loss of 31 lb., the reduction of metabolic rate from + 33 to + 3, and average lowering of the pulse-rate from 120 to 80. The operation is not advocated as a substitute for thyroidectomy, but he thinks that when there is an element of neuro-circulatory asthenia from a recurrent hyperthyroidism, the adrenal should be operated upon. For *peptic ulcer* there have been 39 operations, of which 34 were denervations, with 86 per cent of cures. In a number of cases in which the ulcer has recurred repeatedly after local operations adrenal denervation has given the first real relief from symptoms, and should, therefore, be especially useful in cases in which medical and surgical treatment has failed. Crile has operated on 44 cases of epilepsy and has had 60 per cent of improvement or cure. In a small group of *diabetics* he claims equally good results. This highly original but speculative work of Crile's opens up definite avenues for further research.

G. de Takats<sup>3</sup> has described the technique of *splanchnic nerve section in juvenile diabetes*, the object being the denervation of the suprarenal and liver. The operation is advised only for insulin-resisting cases, so that it is necessary first to use tests for insulin sensitivity. Splanchnic nerve section increases sensitivity to insulin and only the resistant diabetic can derive any benefit from the operation. De Takats uses the supra-diaphragmatic approach in what amounts to a posterior mediastinotomy. The surgical convalescence of three patients who underwent these operations was uneventful. One of the three patients died later in diabetic coma, which emphasizes the importance of choosing the insulin-resistant patient, and he thinks that this case was an unsuitable choice. Only the third does he regard as being completely successful. The operation of splanchnic resection is believed by De Takats to be superior to Crile's adrenal denervation, because the splanchnic nerves control a far larger area than the suprarenal fibres, and the deprivation of the liver of its sympathetic nerve-supply definitely increases its storage and retaining capacity for glycogen. He also believes that regeneration after adrenal denervation occurs rapidly, whilst it can be prevented in splanchnic nerve resection. He puts the operation forward quite tentatively, but with a good experimental background, and advises it only for the juvenile diabetic. He states that it is superior to total thyroidectomy in producing a much greater drop in insulin requirements. There have been no lasting alterations of gastro-intestinal motility and secretion, and of blood pressure.

REFERENCES.—<sup>1</sup>*Brit. Jour. Surg.* 1935, xxxii, April, 864; <sup>2</sup>*Ann. of Surg.* 1934, Oct., 667; <sup>3</sup>*Ibid.* 1935, July, 22.

## SYPHILIS.

Col. L. W. Harrison, D.S.O.

P. Léonard<sup>1</sup> thinks that *sypphilis without chancre* is a fact to be reckoned with in syphilology and one which complicates the preventive work of those who have to trace out cases. He first presents the experimental evidence that sypphilis without chancre occurs quite often in animals. As clinical evidence he relates in detail two cases in which prostitutes were under the most stringent observation at very short intervals for long periods before they presented themselves with full secondary eruptions and positive serum reactions; in neither case

was there before this the slightest sign of any primary sore. In Bordeaux the examination of prostitutes is particularly severe, and the author sought for further evidence supporting his thesis in the records of these examinations. They showed 494 cases of syphilis, of which all but 86 had to be discarded as not presenting clear evidence in one direction or another. The 86 had arrived at Bordeaux free from syphilis, and had therefore been under close observation right up to the time when they presented evidence of infection. In 14 of them no chancre was discovered. Thus, the dictum of Ricord, which was strongly supported by Fournier, "Syphilis always commences with a chancre; there is no syphilis without chancre", is not supported by modern experience.

S. S. Greenbaum, S. Katz, and A. Rule<sup>3</sup> report on the *infectiousness of semen* of patients under treatment. They quote positive findings in the semen by various authors. Thus Finger and Landsteiner (1906) showed the infectiousness for monkeys of semen of secondary cases. Pinard found *S. pallida* by dark-ground microscopy in the semen of 1 out of 12 cases of secondary syphilis, and Pinard and Hock similarly in 3 out of 11 cases. Ebersson and Engman successfully inoculated rabbits with semen in 2 out of 11 cases, and Kertesz similarly in one out of 4 cases. The authors obtained semen of 25 patients, and in each case within half an hour inoculated the specimen into the testicles of two rabbits. After three months' observation the inoculated testes and the inguinal glands were removed, and specimens injected into fresh animals, which were observed for a further three months. The results of the tests (1 such in each of the 25 cases) were negative. The results seem to indicate that possibly the somewhat stringent rules that are usually given respecting marriage of syphilitics might be relaxed. The authors suggest the method as a test of any patient who insists on marrying before he has had 'adequate therapy'.

#### SERUM TESTS.

In 1932 E. J. Wyler<sup>3</sup> published a method of the Wassermann test in which increased amounts of serum were used and showed it to be more sensitive than the Sigma test. In 1933 Fairbrother<sup>4</sup> published a method in which the usual serum dilutions of 1-5, 1-15, and 1-45 were replaced by dilutions of 1-2, 1-8, and 1-32, and found it satisfactory. In a more recent paper R. W. Fairbrother and A. L. P. Peeney<sup>5</sup> compare this method with the Kahn and find it rather more sensitive. The authors conclude that their results support the recommendations of the International Conferences on the sero-diagnosis of syphilis to employ more than one method. They think that, where only one routine laboratory test is carried out, this should be a Wassermann, modified as described above.

R. D. De La Rivière and Hoang Tich Try<sup>6</sup> have made an investigation to discover if drugs used in the treatment of syphilis when mixed *in vitro* with Wassermann-positive serum in the strength which would occur in the body when under treatment would affect the Wassermann reaction. They found that the mercurial salts (cyanide, biniodide, and benzoate, 1-50,000) changed the reactions of 120 positive sera to negative in the following proportions of cases: cyanide, 20 per cent; biniodide, 26.6 per cent; benzoate, 33.3 per cent. Novarsenobenzol (1-3000) added to 66 positive sera made 40.6 per cent of them wholly or partially negative. Bismuth (neotropol) in a concentration of 1-10,000 added to 72 positive sera converted 14 of them to negative or partial negative, and in a concentration of 1-25,000 the effect on the same 72 sera was conversion of 10 to partial negative. [The inference from this would appear to be that serum tests for syphilis should be made when there is little or no antisyphilitic remedy in the patient's blood.—L. W. H.]

P. Dahr<sup>7</sup> reports on his experience of *Cheviak's blood-test* in which a drop of dried blood is used. The advantages of being able to obtain a result from such a specimen are obvious. The method is as follows: A drop of the patient's blood is caught on a microscope slide and defibrinated by rubbing it up with a corner of another slide. It is then allowed to dry, and may be tested as long as seven days later. In the test 0.015 c.c. of a freshly prepared solution containing 3.5 per cent NaCl and 0.03 per cent soda are added to the drop of blood and rubbed up with a corner of a slide. With the edge of a slide it is gathered into a paraffin ring, 1.5 cm. across, on another slide, and to it is then added 0.03 c.c. of a 1-10 dilution of original Meinicke extract for the 'Klärungs Reaktion'. The dilution of the extract is made with the same salt solution as was employed for addition to the blood. The solution must be freshly prepared, and prior to the dilution both extract and diluent are kept in the water-bath at 56° C. for eight minutes. The diluted extract is kept in the bath for two minutes before being added to the blood mixture. After the addition of extract the mixture is shaken for three minutes and kept in the moist chamber at room temperature for half an hour. The result is read with the microscope ( $\times 80$ ). When negative the appearance is that of a fine brown granulation; when positive black flakes and clumps are seen in the red brown fluid. In 600 specimens the agreement with the Wassermann test was 98.3 per cent. In 475 controls the Cheviak method gave 4 doubtful and 4 positive results. With 125 Wassermann-positive sera the Cheviak method gave 112 positives, 2 doubtful, and 11 negative.

#### TREATMENT.

E. J. Trow, N. Black, and H. H. Elliott<sup>8</sup> have analysed the results of treatment of early cases of syphilis at the Toronto General Hospital, and in the cases classed as cured, i.e., as having undergone a thorough course of treatment followed by a year or more of observation in which clinically in blood and in spinal fluid no sign of relapse had appeared, they found the average amount of treatment that had been administered was as follows: in sero-negative primary cases, 6.2 grm. arsphenamine with 1.8 grm. heavy metal, and in sero-positive primary and secondary cases, 11.6 grm. of the arsenical and 1.7 grm. heavy metal. This is far less than is recommended by the Committee of Experts on Syphilis and Congenital Subjects convened by the Health Organization of the League of Nations.<sup>9</sup> This body collected from ninety-three clinics in five countries over 13,000 case-records of primary and secondary syphilis, and after these had been analysed by Professor Martenstein, Dresden, made the following recommendations:—

"1. Treatment should be recommended as early as possible in the sero-negative primary stage. In this connection, the fullest possible use should be made, for purposes of diagnosis, of the microscopical examination of secretion from primary lesions, or from lymph glands.

"2. It should be emphasized that, prior to the institution of either of the systems of treatment outlined below, there should be an adequate physical examination to determine the absence or otherwise of any indication for caution in respect of the dosage.

"3. It is essential that, in carrying out the treatment, a strict supervision of the patient be exercised, especially in respect of mucous membranes, skin, kidneys and liver.

"4. Observation, clinical and serological, after completion of treatment should be adequate and in any case for not less than three years.

"5. Adequate examination of the spinal fluid, at least before dismissal from observation, is essential.



" 6. The principles to be followed in carrying out the actual treatment should be as follows : (a) To employ a comparatively heavy individual dosage of the arsenobenzene and of the bismuth or mercurial compounds, the doses being administered in comparatively rapid succession, especially at the commencement. (b) To maintain a persistent attack on the disease, avoiding intervals of such length as to afford the parasite an opportunity of recovering. (c) To administer approximately as much treatment to primary as to secondary cases.

" 7. The material does not enable a clear decision to be made as to the relative merits of intermittent treatment, with courses of injections in rapid succession separated by rest intervals of some weeks, and continuous treatment, or between the simultaneous employment of both arsenical and bismuth or mercury and the system in which bismuth and mercury are withheld until a number of arsenical injections have been administered.

" Nevertheless it seems practicable from the results of the analysis and from the personal experience of the experts to formulate a system of intermittent treatment and one of continuous treatment either of which can be expected to yield satisfactory results in ordinary cases of early syphilis.

" It seems possible that the intermittent treatment which is suggested below may in effect be continuous, or practically continuous, treatment owing to the continued absorption of bismuth from the sites of the injection for some weeks after any temporary suspension of the treatment."

The plan of intermittent treatment suggested for adult males in whom there is no contra-indication consists of a number of courses of injections with an interval of three to five weeks between any two courses. Each course consists of 8 injections of 0.6 to 0.75 grm. '914' or 0.4 to 0.5 grm. '606' at weekly intervals, concurrently with 8 injections of an insoluble compound of bismuth, in a dose that is calculated to contain 0.20 to 0.24 grm. metallic bismuth, and then 2 more injections of bismuth, making a total of 8 arsenical and 10 bismuth injections in nine weeks. The recommended number of such courses is four in cases found to be negative at the end of the first, while in cases not negative by that time the number of courses should be three after that course which ends with negative reactions. The alternative plan of alternating continuous treatment suggested by the Committee of Experts follows closely that recommended by the Co-operative Clinical Group in the U.S.A. (*see below*) after their extensive analysis of their pooled records. It provides for sixty-nine weeks of practically continuous treatment. This starts with three doses of 0.3 to 0.6 grm. '606' (or equivalent in '914') during the first ten days ; and then the following in succession, the injections being given at weekly intervals :  $5 \times 0.4$  grm., '606' ;  $4 \times 0.2$  grm., Bi metal (in the form of the salicylate) ;  $6 \times 0.4$  grm. '606' ;  $6 \times 0.2$  grm. Bi ;  $6 \times 0.4$  grm. '606' ; 8 Bi ;  $6 \times 0.4$  grm. '606' ; 10 Bi ;  $6 \times 0.4$  grm. '606' ; 10 Bi. Alternatively three courses of 10 to 12 arsenical injections may be given alternating with courses of heavy metal (Bi or Hg). In this case each course of heavy metal is to begin two to four injections before the end of the arsenical course, continue through the interval between the arsenical courses, and on into the next one. This alternative plan of arranging an overlap of heavy metal is a concession to those who believe that to begin treatment of an early case of syphilis with arsenic alone conduces to the development of neurosyphilis.

J. H. Stokes, with Lida J. Usilton, H. N. Cole, J. E. Moore, P. A. O'Leary, U. J. Wile, T. Parran, jnr. and J. McMullen,<sup>10</sup> who constituted the Co-operative Clinical Group referred to above as having influenced strongly the formulation of the League of Nations Committee's plan of continuous treatment, have published an article entitled, "What Treatment in Early Syphilis Accomplishes".

It is divided into three sections as follows: (1) Relapse and curative results; (2) Optimum treatment; and (3) Comparison of Bruusgaard's work and the 3- to 20-year results of the Co-operative Clinical Group. It is based on elaborate analyses of treatment results obtained in five syphilis clinics in U.S.A. It deserves special study in the original, particularly as it is difficult to summarize its thirty pages here.

In the first section the authors discuss the results in the 1360 cases of their material that were observed and treated for two years or longer. The treatment system which afforded the best results in their hands, the continuous, gave 84.6 per cent satisfactory results in sero-negative primary syphilis and 81.5 per cent in fully developed secondary, but only 64.3 per cent in sero-positive primary; this stage also afforded the highest incidence of mucocutaneous relapse. The authors discuss the reasons for these differences in results. They suggest that: (1) In sero-negative primary syphilis the spirochaetes are not entrenched and therefore the spirochæticidal action of the drugs gets full play. (2) In secondary syphilis the treatment is helped by antibody developed in consequence of interaction between spirochaetes and muco-cutaneous tissues. (3) In sero-positive primary syphilis the spirochaetes are entrenched and there has not been sufficient time for the development of antibody. The lesson is that sero-positive primary cases require particularly well-sustained treatment.

In the second paper are discussed the amounts of treatment which afforded the highest proportion of satisfactory results. The results with varying amounts of treatment are shown in a number of tables which, with the authors' conclusions, afford the reasons for their recommendations for treatment. These are embodied in the plan of alternating continuous treatment published by the League of Nations Committee of Experts, which was summarized above.

In the third paper the authors' results in treated cases are compared with those shown in Bruusgaard's<sup>11</sup> well-known analysis of Caesar Boeck's series of untreated cases. Again, one must advise a study of the authors' paper in the original since it is possible here to give only their summary as follows:—

"1. A comparison is made of 907 cases of treated early syphilis (Co-operative Clinical Group) with 145 cases of untreated early syphilis (Bruusgaard series) observed from 3 to 10 and 10 to 20 years.

"2. Clinical neuro-syphilis is from 2 to 4 times as frequent in the untreated as in the treated cases.

"3. The frequency of bone and skin lesions in untreated cases is 17 to 26 times as great as in treated cases.

"4. Treatment renders 77 per cent to 63 per cent of patients symptom-free and Wassermann-negative in the 3- to 20-year observation period, as compared with 24 per cent to 36 per cent without treatment.

"5. Even sero-negative treated patients will present 1.5 per cent to 1.2 per cent abnormal spinal fluids after 3 to 20 years.

"6. Adequate treatment by an effective technique gives 96 per cent symptom-free patients with positive or negative blood-tests after 3 to 10 years, while no treatment gives 61 per cent.

"7. In the 10- to 20-year observation period, the same treatment gives 74 per cent; no treatment, 50 per cent.

"8. Complications develop largely in irregularly treated patients. The proportion of abnormal spinal fluids in such patients, otherwise negative, may reach 4.5 per cent in the 3- to 10-year period.

"9. While the relative benignity of many aspects of untreated syphilis is conceded, the results summarized in Items 4 and 6 fully justify adequate and systematic modern treatment for early syphilis."

A. Tzanck, J. Pautrat, and E. Sidi,<sup>12</sup> working in a clinic dealing with a very

large turnover of cases of syphilis, have tried to discover the factors making for success in reversing serum reactions, as also those responsible for failure. For the purpose they have studied 32 cases in which persistent treatment for four years failed to reverse the reactions and 15 similar failures after three years treatment. They find that the cases comprised patients treated insufficiently or not at all in the early stages and patients in whom the disease was discovered accidentally—that is to say, much too late. In no case treated regularly from the beginning was the serum reaction found to be resistant. In other words, it is not so much the variety of treatment as its earliness and regularity which matters.

C. C. Dennie and W. L. McBride,<sup>13</sup> in a paper on the treatment of resistant somatic syphilis, hold that the resistance to treatment is due to failure of the defence mechanism, the reticulo-endothelial system, to respond. The defect may be remedied by stimulating the defence with malaria, heat therapy, or typhoid vaccine, of which malaria is the best. They give examples, including fourteen cases of interstitial keratitis, in which malarial treatment caused the acute symptoms to vanish in from four to eight weeks.

H. Gougerot,<sup>14</sup> in an article of great length, argues that skin reactions play a large part in the body's resistance to *S. pallida*. He quotes R. Bernard's evidence to the effect that patients treated for the first time when they have reached the secondary stage suffer much less from neurosyphilis than do those treated in the primary stage. He adds to this the frequent reversal of the serum reactions after an arsenical dermatitis, though he is careful to say that this apparently beneficial effect should not be exaggerated into evidence of cure. Similarly in persons who are subject to dermatoses of various types, whether chemical or from parasites, syphilis often runs a mild course, and the supervention of such a dermatosis may influence for the better a neurosyphilis; of this the author gives a number of examples. For this reason the author suggests that antisyphilitic drugs may well be supplemented by measures designed to make the skin react; e.g., sulphur inunctions, vesicants such as turpentine, mercurial inunction, radiant heat, and ultra-violet radiations. He points out that in Europe syphilis of the sixteenth century was mainly external and really mild, being responsive to treatment, but has gradually become internal and more resistant. Syphilis of the Northern African remains Columban and free from nerve complications. He discusses the reasons, and suggests that the type has remained as when first introduced into Northern Africa because of: (1) The dirty condition of their skins, with numerous traumas, infections, and animal parasites; (2) Insolation of the skin; and (3) Lack of specific treatment, leaving the skin with full opportunity to develop the defensive forces which result from interaction between it and *S. pallida*. The author concludes that the moral is to treat thoroughly and to supplement the specific action of drugs by measures, as mentioned above, designed to stir up inflammatory reactions in the skin.

**Pyrogenic Treatment.**—The effect of mechanically produced hyperpyrexia on early syphilis has been studied by N. N. Epstein and M. Cohen.<sup>15</sup> The method employed eventually was to enclose the body and limbs in several blankets and a rubber sheet. [For details of the technique the original article should be consulted. For other methods of inducing hyperpyrexia, see GONORRHOEA.—L. W. H.] During the treatment close observation of the patient was maintained; the temperature was taken every half hour and not allowed to go over 104.9° F. This temperature was maintained for six to seven hours. The patient was made to drink 160 c.c. of hot lemonade containing 0.6 per cent sodium chloride every half hour, and sedatives were given in the event of restlessness. Treatments were repeated every three or four days. In 33 patients

with early syphilitic lesions in the serum of which *S. pallida* was demonstrated before the treatment, 10 showed no *S. pallida* immediately after the first treatment, and in 9 more they could not be found in the lesion juice by the time of the second sitting. In 7 further cases no *S. pallida* was found after the second sitting, and in 2 there were none after the third and fourth treatments. The clinical effects corresponded with those on *S. pallida*, and generally the results confirmed the evidence of experiments on animals that temperatures that can be tolerated by human beings are sufficiently damaging to *S. pallida* to suggest that hyperpyrexia produced by physical agencies can be a valuable adjunct to chemotherapy in the treatment of syphilis.

A. M. Culler, Miami Valley Hospital, Dayton,<sup>16</sup> reports excellent effects of artificial fever in 58 patients with various manifestations of ocular syphilis. The fever was produced by a Kettering hypertherm (see GONORRHOEA) and maintained for five hours at 105° F. in each of ten weekly sessions. Concurrently with this treatment thirty injections of bismarsen were given. Most of the cases had not responded to ordinary antisyphilitic treatment. The cases and results were as follows: Four extra-ocular paralysis, no evidence of superiority in the method. Eleven interstitial keratitis, results very good, especially in those with an opaque central disc. Ten exudative uveitis, prompt clinical improvement after the first or second sitting, results so good as to make this the treatment of choice. Fourteen optic neuritis and neuro-retinitis, rapid and good response. Seven choroiditis, good central vision in all but one. Sixteen optic atrophy, unchanged. The results generally show that in syphilitic exudative ocular disease fever combined with specific remedies ought to be instituted as soon as possible. W. M. Simpson, of the same hospital and at the same conference, reported on the treatment to completion of 132 patients with other forms of syphilis. The method was the same as in Culler's series. As a consequence of its good effects the author believes that fever therapy in conjunction with specific ought to start as early as possible, since the evidence appears to be that it enhances the action of the chemo-therapeutic agents, and, in view of the well-known fact that a large proportion of patients do not persevere with treatment, it is important to take the utmost possible advantage of the opportunities for curing the disease when the patient does attend.

**Bismuth Treatment.**—A. Sézary, A. Barbé, and Lackenbacher<sup>17</sup> have examined again the question of the penetration of bismuth into the cerebro-spinal fluid. They thought that Sézary, Barbé, and Pomaret had long ago definitely disproved this, but recently Hanzlik and colleagues (see MEDICAL ANNUAL, 1933, p. 468) had reported experiments purporting to show that, when bismuth is given in the anionic form, it can be detected in the spinal fluid. Sézary and colleagues have tested this statement by experiments with an iodide of bismuth, and conclude that, when the chemical method employed is faultless, bismuth is not found in the spinal fluid.

**Administration of Iodides.**—W. R. Snodgrass<sup>18</sup> has carried out a number of very interesting observations on the effects of the iodides of sodium and of potassium administered in different ways in 1750 cases. Study of his article in the original is strongly recommended, for only broad conclusions can be given here. His observations support the generally held view that iodides have no directly spirochaeticidal effect, but stimulate resolution of syphilitic lesions. With regard to intolerance of iodides given by the oral route, iodism occurred in 12 per cent of cases on an initial dose of 5 gr. or less, in about 7½ per cent when the initial dose was 10 to 30 gr., and in less than 1 per cent when the dose was higher. It could usually be stopped by increasing the dose to 30 gr., but the surest method was to give from 60 to 90 gr. sodium iodide by the intravenous route, telling the patient to continue with the oral mixture. The

least digestive disturbance occurred when the remedy was administered immediately before meals in plenty of water. The taste was best disguised by adding the solution to half a tumblerful of milk. With regard to dosage, the experiments support the recommendations of William Wallace, the Dublin surgeon who in 1832-6 first established the systematic use of potassium iodide in late syphilis. Wallace recommended 15 to 30 gr. of potassium iodide thrice daily, and generally Snodgrass found no additional benefit from higher doses; in fact, since the effect of 15 gr. thrice daily was usually equal to that of double this amount, the smaller dose seemed to him to be advantageous for routine use. A dose as small as  $\frac{1}{4}$  gr. was found to have a definite, though slow, resolving effect. Repetition of the dose three times a day was found to be better than a single daily dose. The interpolation of a single large dose (90 to 240 gr.) of potassium iodide by mouth or, perhaps more conveniently sometimes, one of 60 to 120 gr. sodium iodide (in 10 per cent solution) intravenously temporarily accelerated the rate of resolution. It is suggested, therefore, that in cases where resolution is unduly slow the administration of 15 gr. potassium iodide thrice daily by mouth might well be supplemented by a weekly intravenous injection of 60, 90, or 120 gr. sodium iodide.

**Prevention and Treatment of Toxic Effects of Arsenobenzene Preparations.**—H. Orr,<sup>19</sup> in an article on various toxic effects of the arsphenamines, mentions the following. The *nitritoid crisis*, with symptoms similar to those produced by administration of amyl nitrite, is best treated by subcutaneous injection of 1 c.c. of adrenalin. In many cases it can be prevented by giving 20 to 30 min. of sp. ammon. arom. in a little water five minutes before the injection and by making this very slowly. [A simple method of preventing a nitritoid crisis, which works well in most cases, is to leave the tourniquet on the upper arm and inject slowly, alternately injecting 2 c.c. solution and drawing into the syringe 1 c.c. blood.—L. W. H.] *Medical shock* is much rarer than the nitritoid crisis. It is due to capillary paralysis, and adrenalin is useless for it. The pulse becomes imperceptible, and the signs of collapse are alarming; the condition calls for intravenous saline to at least a litre. For *dermatitis* he recommends, besides intravenous injection of 10 to 20 c.c. of a 10 per cent solution of sodium thiosulphate (or 5 c.c. of a 10 per cent solution of calcium thiosulphate), milk and soft foods, and a daily starch bath (2 lb. in 30 gallons of water) followed by dusting with talc, or by application of olive oil if there is much desquamation. For *encephalitis* he quotes the recommendation of Schamberg and Wright as follows: bed; spinal puncture, withdrawing 50 c.c. fluid; venesection, withdrawing 60 to 100 c.c. blood; thorough purging; large doses of bicarbonate of soda; injection of adrenalin in 5-min. doses every four hours by day; inhalation of oxygen, as there is reason to believe there is an anoxemia of the brain. M. A. Glaser, C. P. and S. W. Imerman,<sup>20</sup> in a review of 158 cases of this complication (155 in the literature and 3 of their own), gave treatment as follows in two of their cases which recovered. First case: intravenous injection of 10 c.c. of 10 per cent sodium thiosulphate and of 50 c.c. of 50 per cent glucose three times a day; normal saline hypodermoclysis; 1 per cent glucose per rectum; and three lumbar punctures. Recovery began six days after onset of the complication. Second case (which was not so severe as the first): limitation of fluids and intravenous injection of 50 c.c. glucose (50 per cent), and of sodium thiosulphate every three hours. [This complication is fortunately rare, but the fact that it is very fatal and that probably earliness of intervention is an important factor in preventing death suggest that everyone who uses any of the arsphenamine remedies ought to have the directions and means for its treatment readily available. Whilst agreeing generally with Schamberg and Wright's recommendations given above,

and adding to these the intravenous injection of glucose, I would be inclined to draw off much more blood, say 300 c.c.—L. W. H.] In the three main toxic effects on the bone-marrow Orr suggests, for *thrombocytopenia*, no treatment necessary; for *agranulocytosis*, administration of pentose nucleotide K 96 (made by Smith, Kline and French Laboratories, Philadelphia\*), and of large doses of bone-marrow; and for *aplastic anemia*, these plus repeated blood transfusions.

J. Bénech<sup>21</sup> suggests for the prevention of toxic effects that the arsenobenzene compound should be dissolved in a solution of the amino acid, glycocoll. This he keeps already prepared in ampoules containing 5 c.c. of a 4 per cent solution. Usually one ampoule is sufficient, but when higher doses of '914' are given, e.g., 0.75 grm., it may be necessary to use two. He reports a number of cases in support of his recommendation. This is based on an article by Rebaudi<sup>22</sup> in which he showed that the amino acids are detoxicating.

**Prevention of Headache following Lumbar Puncture.**—Examination of the cerebrospinal fluid is essential in the management of syphilis, and the prevention of headache following it is particularly important to all syphilologists. The investigations of numerous workers point strongly to leakage of spinal fluid through the puncture opening as the cause of the headache, and the inference is that the finer the needle which passes through the arachnoid the less likely the headache. This has been shown to be true by various comparisons of the incidence of headache in parallel series of cases in one of which a fine needle was used and in the other a stout one. H. W. Allen<sup>23</sup> provides further evidence to the same effect. He used a Dattner's modification of Hoyt's needle. In this a very fine inner needle is carried inside an outer one, and when the dura mater is reached the inner needle can be pushed on through it and the arachnoid into the canal. Naturally with such an arrangement it sometimes happens that the outer needle is pushed too far and punctures the arachnoid, so that in a series some of the punctures will be with a stout needle, and most, it is hoped, with a fine one. In Allen's series of 127 punctures 11 were made with the stouter needle and 6 had headache (5 severe), while of 116 in which only the fine needle entered the canal, 18 had some headache but this was severe in only 2 of them. (*See also CEREOSPINAL FLUID—LUMBAR PUNCTURE HEADACHE.*)

REFERENCES.—<sup>1</sup>*Jour. Med. de Bordeaux*, 1935, cxii, 433; <sup>2</sup>*Amer. Jour. Syph. and Neurol.* 1935, xix, 210; <sup>3</sup>*Ministry of Health Special Report*, No. 67; <sup>4</sup>*Lancet*, 1933, ii, Sept. 9, 590; <sup>5</sup>*Ibid.* 1934, ii, Sept. 29, 701; <sup>6</sup>*Comptes rend. Soc. de Biol.* 1935, cxviii, 1270; <sup>7</sup>*Deut. med. Woch.* 1934, ix, 94; <sup>8</sup>*Canad. Pub. Health Jour.* 1934, xxv, 422; <sup>9</sup>Committee of Experts on Syphilis and Cognate Subjects convened by the Health Organization of the League of Nations, *Lancet*, 1935, i, May 18, 1170, *Brit. Jour. Ven. Dis.* 1935, xl, 69; <sup>10</sup>*Amer. Jour. Med. Sci.* 1934, clxxxviii, 660, 669, 678; <sup>11</sup>*Arch. f. Dermatol. u. Syph.* 1929, clvii, 309; <sup>12</sup>*Bull. Soc. méd. Hôp. de Paris*, 1934, Oct. 29, 1322; <sup>13</sup>*Arch. Dermatol. and Syph.* 1934, xxx, 1; <sup>14</sup>*Bruzelles-méd.* 1934, xiv, 1396, 1444, 1463; <sup>15</sup>*Jour. Amer. Med. Assoc.* 1935, civ, March 16, 883; <sup>16</sup>Fifth Annual Fever Conference, Dayton, Ohio, May 1935, 105; <sup>17</sup>*Bull. Soc. méd. Hôp. de Paris*, 1934, Nov. 5, 1369; <sup>18</sup>*Quart. Jour. Med.* 1935, iv, July, 247; <sup>19</sup>*Canad. Med. Assoc. Jour.* 1935, xxxii, Jan., 18; <sup>20</sup>*Amer. Jour. Med. Sci.* 1935, clxxxix, 64; <sup>21</sup>*Presse méd.* 1935, xliii, Feb. 20, 283; <sup>22</sup>*Ann. des Malad. vener.* 1934, July, 481, ref. Bénech; <sup>23</sup>*Brit. Med. Jour.* 1934, ii, 349.

## SYPHILIS, INHERITED.

Reginald Miller, M.D., F.R.C.P.

J. A. Nixon,<sup>1</sup> writing on the recognition of inherited syphilis in children, says that it was hoped that with the establishment of V. D. Clinics there would be a decrease in the incidence of inherited syphilis, but that no figures are available to determine if there has been any diminution at all. He lays stress on the diagnostic value of Diday's law of the gradual decrease in the foeticidal

\* Obtainable from Menley & James Ltd., 64, Hatton Garden, London, E.C.1.

action of the syphilitic poison. A series of miscarriages, all at about the same stage of pregnancy, is not to be regarded as suggestive of syphilitic infection. In this disease the maternal history should be a sequence of (1) abortions, (2) still-births, (3) heredo-syphilitic children, and (4) healthy children. The Wassermann reaction of the blood is not necessarily to be relied upon if negative. Only in cases of massive infection can one count on a positive result, and even in this case it does not become positive until the third week of life. In early cases of muco-cutaneous or gummatous lesions the reaction is positive in 100 per cent of cases. Even without treatment the reaction in time tends to show fewer positives, and above the age of 16 the proportion of positives may be only 5 per cent. In the latent and dystrophic forms of inherited syphilis the reaction is often negative throughout.

Nixon gives the following signs as those by which in his opinion inherited syphilis may be recognized with certainty: (1) At birth or in very early infancy, pemphigus of the palms and soles, and the coryza or snuffles, are unmistakable signs. (2) Splenomegaly if chronic before the age of three months. (3) Muco-cutaneous syphilides, especially on the face and outer side of thighs. (4) Gumma of the umbilicus; chronic orchitis. (5) Pseudo-paralyses of Parrot; osteochondritis. (6) Irido-cyclitis; pigmentary retinochoroiditis (not retinitis pigmentosa). (7) In later childhood Hutchinson's triad: deafness, interstitial keratitis, and the characteristic teeth. (8) Sunken bridge of nose; perforation of palate. (9) Juvenile tabes and G.P.I. (10) Periostitis of the tibia and 'hot-cross-bun' skull. (11) Old scars. (12) Positive Wassermann reaction in blood or cerebrospinal fluid, cytology and chemistry of cerebrospinal fluid.

**Clutton's Joints.**—The symmetrical serous synovitis found in inherited syphilis, and usually alluded to under the name of 'Clutton's joints', remains a curious and interesting manifestation of the disease. Although such lesions had been described earlier, they were first fully described in 1886 by Clutton, who wrote: "I have never seen both knee-joints filled with fluid causing scarcely any pain or discomfort, whilst the other joints remain quite free of any signs of inflammation, except in cases where there were complete evidences either past or present of hereditary syphilis".

J. Klauder and H. F. Robertson,<sup>2</sup> in a series of 363 congenital syphilitics, found that 63 had Clutton's joints and that in every case the knee was involved, though in two patients there was concomitant inflammation of the elbow. As seen in the knees, swelling is the chief, almost the only, symptom. There may be slight discomfort on walking, but even this is exceptional, and in most cases pain is entirely absent. The movement of the knees may be slightly limited by the excess of fluid present in the joints, but there are no ordinary signs of inflammation such as heat, redness, or tenderness. The majority of patients with this complaint are between the ages of 8 and 15 years. There is a close association between Clutton's joints and interstitial keratitis, and therefore with Hutchinson's teeth. This triad is more commonly seen than keratitis, notched teeth, and deafness (Hutchinsonian triad).

Without treatment it is supposed that Clutton's joints remain affected for months or years. They react to antisypilitic treatment in much the same way as does interstitial keratitis. Authorities differ in their views as to the success of treatment, but there seems little doubt that the course of the complaint is definitely modified by antisypilitic treatment, although quick cures are exceptional.

REFERENCES.—<sup>1</sup>*Clinical Jour.* 1934, lxiii, 397; <sup>2</sup>*Jour. Amer. Med. Assoc.*, 1934, ciii, 236.

**SYRINGOMYELIA.** (See SPINE AND SPINAL CORD, SURGERY OF.)

**TESTIS, SURGERY OF.***Hamilton Bailey, F.R.C.S.*

**The Endocrine Treatment of Malescent of the Testis.**—It has been proved that the descent of the testis is influenced profoundly by a hormone isolated from the urine of the pregnant female. T. Engle<sup>1</sup>, in his studies of the anterior-pituitary-like hormone of pregnancy urine, injected this into immature male apes. The testes doubled in size and descended. Conversely, E. Hisaw (quoted by H. Burrows<sup>2</sup>) found that the administration of any ovarian extract to male pocket-gophers during the breeding season caused the testes to return to the abdomen.

The endocrine treatment of malescent of the testis shows some promise. At least it should eradicate arguments in favour of the policy of waiting—waiting until it is too late to perform a successful orchidopexy. If malescent testes do not descend under endocrine treatment, it is inconceivable that they will do so by waiting longer. A. W. Spence and E. F. Scowen<sup>3</sup> injected 500 rat-units of *pregnyl* (Organon)\* intramuscularly into each of eleven boys between 4½ years and puberty. In successful cases the descent of the testes took place in periods varying from two to eleven weeks. In two out of five patients with bilateral malescent both testes descended. In two others the organ came down on one side. In half the unilateral cases descent occurred as a result of the injections.

**Tuberculosis of the Epididymis.**—Tuberculosis of the epididymis begins more commonly in the globus minor than in the globus major. The tubercle bacillus reaches the epididymis through the lymphatics, perhaps also by way of the vas deferens, but not often through the blood-stream. The testicle itself is involved but rarely until late, so castration is seldom necessary. In the majority of cases where the seminal vesicles are involved this is the primary focus. H. H. Young supports Kocher's assertion that an operation on genital tuberculosis is indicated even though the lungs are involved. If the genital focus is eliminated there is a better chance of arresting the advance of the pulmonary lesion.

H. H. Young,<sup>4</sup> in a follow-up of fifty cases of radical removal of the seminal tract for genital tuberculosis, by which is meant the epididymis, vas, seminal vesicles, and common ejaculatory duct, *en bloc*, finds that his results were superior to those where more conservative measures were employed.

A. B. Cecil<sup>5</sup> has found epididymectomy an extremely satisfactory operation in certain cases of testicular tuberculosis. He considers that the poor reports of the operation in the hands of some operators is due to imperfect technique. His well-thought-out operation is as follows. After the epididymis has been dissected free it is still attached to the vas. The testicle and the epididymis are each wrapped up in saline-soaked swabs. The vas is then divided, and after the cut surfaces have been cauterized the vas is pulled up and out of the minute puncture wound in the groin. It is then left attached to a hæmostat. The scrotum is closed by interrupted stitches and supported. In about eight days the vas comes away at the skin level, much as an umbilical cord shrivels and dies.

*Ultra-violet rays* have given promising results in cases of urogenital tuberculosis. In tuberculous epididymo-orchitis the treatment is begun gradually, depending on the skin reaction. Short exposures of 7 or 8 minutes at 12 to 15 in. have worked well (S. L. Wang<sup>6</sup>).

**Cysts of the Epididymis.**—Cysts of the epididymis are seldom unilocular. Typical advanced examples show the body of the testis surrounded by a helmet-shaped aggregation of cysts. No normal epididymis remains. Cysts of the

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\* Roberts & Co., 76, New Bond Street, London, W.1.



epididymis are by no means uncommon, and at the Salford Royal Hospital E. D. McCrea<sup>7</sup> reports that the ratio was one cyst of the epididymis to five vaginal hydroceles. The disease is often bilateral and is quite unusual before the age of 40. The fluid contained in the cysts always lacks the yellow tinge of hydrocele fluid. It is often crystal clear, but occasionally milky, and contains spermatozoa. The most likely explanation of the occurrence of the cysts is obstruction to the more distal portion of the sperm-conducting mechanism. In support of this theory, ligation of the vas sometimes [very seldom—H. B.] produces cystic degeneration of the epididymis.

**TREATMENT.**—Partial excision of the cyst wall does not prevent cystic dilatation of the remainder of the epididymis, and McCrea is inclined to think that the best treatment in many cases is epididymectomy.

**Differential Diagnosis of Torsion of the Spermatic Cord and Epididymo-orchitis.**—It is often difficult to differentiate between torsion of a fully descended testis of some hours' standing and acute epididymo-orchitis. In both conditions there is redness of the scrotum, and even in cases of torsion there is a moderate elevation of temperature. D. T. Prehn<sup>8</sup> has found that in cases of acute epididymo-orchitis elevation and supporting the testis by a bandage invariably relieves the pain within an hour. If the case is one of torsion, the pain is increased by this measure.

**Spontaneous Thrombosis of the Pampiniform Plexus.**—D. McGavin<sup>9</sup> reports two cases of spontaneous thrombosis of the left pampiniform plexus. The condition is difficult to diagnose. In the acute stage acute epididymo-orchitis or torsion of the spermatic cord will probably enter the differential diagnosis. After the acute symptoms have subsided the thrombosed mass is mistaken easily for tuberculous epididymitis or a new growth of the epididymis.

**Neoplasms of the Testis.**—As is well well-known, nearly all tumours of the testis are malignant. A. U. Desjardins et al.<sup>10</sup> endeavour to correct an impression that these tumours are particularly rare and of little importance to the practitioner. Between 1920 and 1929 no fewer than 155 cases of testicular neoplasm were seen at the Mayo Clinic. At the present time a correct diagnosis is unusual until the condition is far advanced.

**Clinical Features.**—The age incidence of the condition is depicted in Fig. 66. The first symptom is an increase in the size of the testes. There is no pain until the growth has been present for many months. The tumour can be moved within the scrotum, and usually can be squeezed gently without pain. Not infrequently a hydrocele or hæmatocele masks the underlying swelling, requiring withdrawal of the fluid before the testis can be palpated properly. Blood-stained fluid in the tunica vaginalis indicates that the growth has invaded the epididymis. Only too often the diagnosis is not made before secondary growths are manifest. The differential diagnosis of testicular swellings is notoriously difficult, and uncertainty as to the nature of the swelling has resulted in loss of valuable time before the institution of proper treatment.

**The Hormone Test for Malignant Testis.**—The majority of tumours of the testis are embryonal, and urine from these patients, when injected into immature female mice, produces gross enlargement of the uterine horns and/or

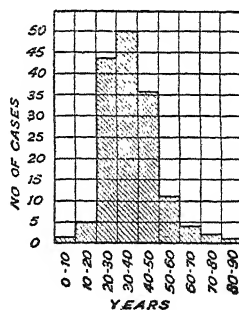
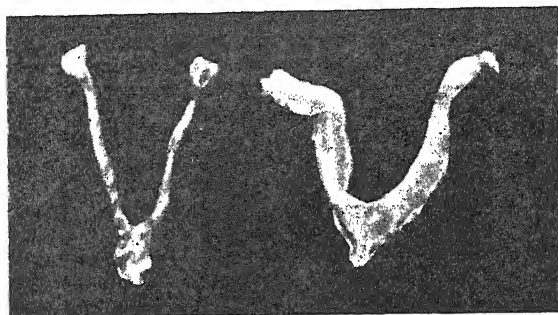


Fig. 66.—Age incidence of neoplasms of the testis.  
(After A. U. Desjardins, V. S. Counseller, and C. Gjanurco. From the 'American Journal of Surgery'.)

ripening of the ovarian follicles (*Fig. 67*). The presence of such a hormone in the urine is strong confirmatory evidence of testicular malignancy. The effect of irradiation upon the amount of hormone, as determined by quantitative



*Fig. 67.*—The hormone test for malignant testis. A, Uterus, tubes, and ovaries of an immature female rat; B, After five subcutaneous injections of urine from a subject suffering from testicular teratoma. Rat killed 100 hours after first injection. (After Hinman and Powell. *Re-traced from the 'American Journal of Surgery'.*)

estimation, gives a good indication of radio-sensitivity—that is, whether or not the patient would benefit by deep X-ray therapy. The re-appearance of a positive hormone test in a patient who has been treated for a malignant testis will foretell that secondary growths are forming before they are manifest clinically (Hinman and Powell<sup>11</sup>).

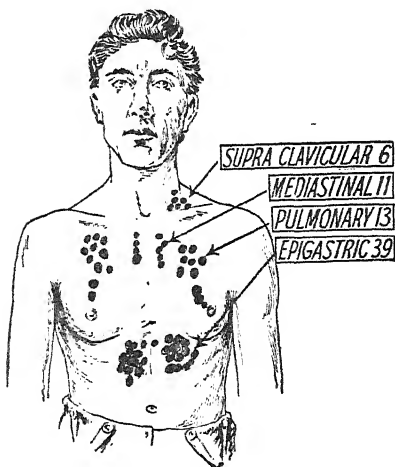
The hydrocele fluid of a patient with a tumour of the testis contains relatively more of the hormone than the patient's urine.

Malignant disease of the testicle usually begins and is confined to the body of the organ. Occasionally it begins in the epididymis, and naturally, when it does so the diagnosis is nearly always confused with tuberculosis. C. A. Coleman, J. A. Mackie, and W. M. Simpson<sup>12</sup> report a case of primary carcinoma of the epididymis and they collected 21 other examples. J. P. Robertson and J. B. Gilbert<sup>13</sup> describe tuberculous and malignant disease in the same testicle, and have collected similar cases from the literature.

D. W. Mackenzie and N. Ratner<sup>14</sup> found that of 64 testicular tumours 12.2 per cent occurred in maldescended testes. When one considers that

maldescended testis occurred only in 3.1 per 1000 males examined for the U.S. Army there seems little doubt that malignancy occurs more frequently in the maldescended organ.

**The Spread of Metastases.**—The main path is via the lymphatics accompanying



*Fig. 68.*—Distribution of glandular metastases in teratoma of the testis.  
(R. S. Ferguson's statistics.)

the spermatic artery to the retroperitoneal glands above the level of the umbilicus. Secondary growths in this situation sometimes attain immense size and obstruct the ureters or the intestine (D. N. Eisendrath and H. C. Rolnick<sup>15</sup>). From here lymphatic drainage is towards the mediastinum and the supra-clavicular fossa (*Fig. 68*). Involvement of the inguinal nodes is rare. Sometimes early pulmonary metastases occur by way of the veins. A radiograph of the chest, therefore, should not be omitted.

**Staining Human Spermatozoa.**—W. W. Williams et al.<sup>16</sup> have evolved a simple and efficient method of staining spermatozoa. It can be carried out in the consulting-room. When a specimen of semen has to be kept for staining purposes a small crystal of thymol added to the fluid semen will preserve it for several weeks without recognizable morphological changes in the spermatozoa resulting.

**Details of the Technique.**—(1) Cover a film with 0.25 per cent aqueous solution of crystal gentian violet for three minutes; (2) Wash with water; (3) Decolorize with 95 per cent alcohol for a minute; (4) Wash with distilled water; (5) Counterstain with 1 per cent aqueous solution of rose bengal for eight seconds; (6) Wash with water and examine under the microscope. The crystal violet colours the nucleus pale blue. The rose bengal causes the protoplasm about the nucleus to stain a reddish colour. The middle piece and the tail are stained faintly.

REFERENCES.—<sup>1</sup>*Endocrinology*, 1932, xvi, 506; <sup>2</sup>*Brit. Jour. Surg.* 1934, xxi, 507; <sup>3</sup>*Lancet*, 1934, ii, 1236; <sup>4</sup>*Jour. Amer. Med. Assoc.* 1935, civ, 722; <sup>5</sup>*Jour. of Urol.* 1935, xxxiii, 160; <sup>6</sup>*Jour. Amer. Med. Assoc.* 1935, civ, 720; <sup>7</sup>*Brit. Jour. Urol.* 1935, vii, 152; <sup>8</sup>*Jour. of Urol.* 1934, xxxii, 191; <sup>9</sup>*Lancet*, 1935, ii, 368; <sup>10</sup>*Amer. Jour. Surg.* 1935, xxvii, 71; <sup>11</sup>*Trans. Amer. Genito-Urin. Surgeons*, 1934, xxvii, 366; <sup>12</sup>*Surg. Gynecol. and Obst.* 1932, lv, 111; <sup>13</sup>*Jour. of Urol.* 1934, xxxii, 291; <sup>14</sup>*Ibid.* 359; <sup>15</sup>*Urology*, 3rd ed., 1934; <sup>16</sup>*Jour. of Urol.* 1934, xxxii, 201.

## TESTIS, UNDESCENDED.

John Fraser, Ch.M., F.R.C.S.Ed.

The desirability of placing the imperfectly descended testis in the scrotum is generally recognized, and the recommendation is based upon three reasons in particular—to encourage normal testicular development and spermatogenesis, to lessen the risks of trauma, and to remove a disturbing psychic influence. But, though these indications are clear and well established, there are certain problematical points upon which opinion is apt to differ.

F. I. Harris<sup>1</sup> discusses the question of treatment in an interesting and suggestive paper. After quoting authorities who support the view that surgical interference is indicated in all cases before the age of puberty and even earlier, he disputes the truth of such a general statement, and claims that a more correct attitude to adopt is to recognize that imperfect descent of the testis arises under one or other of two conditions: (1) A mechanical interference with the descent, such as adhesions; and (2) An endocrine deficiency resulting in an unduly early arrest of the descent. In the first instance operation offers the only prospect of improvement, but in the second type endocrine therapy should be given a thorough trial before operation is advised.

The story of *endocrine therapy* in cases of this kind is an interesting one. It is based upon the recent experimental work of E. T. Engel.<sup>2</sup> Working upon the macacus monkey, in which the testes at birth are in the upper end of the inguinal canal and do not normally descend for a few years, he found that injection of the anterior pituitary hormone isolated from the urine of pregnant women produced a series of spectacular phenomena. Within a few days a remarkable development and elongation of the immature scrotum was evident, and by the end of a month both testes had descended into a fully developed scrotum.

On the basis of this work Harris has treated seven cases ranging in age from 5 to 12 years. They were given injections of anterior pituitary hormone in the form of antuitrin S (a dose of 100 rat units was used for each injection), and in five instances the effect might be described as dramatic, for after three injections, given at a week's interval, the testis had completely descended into the scrotum. The two cases which failed to respond were examples of a mechanical interference with descent which necessitated operation.

It has hitherto been thought that the cases of imperfectly descended testis likely to respond to endocrine therapy were those in which the testis occupied the inguinal canal. H. S. Rubenstein<sup>3</sup> reports a case in which treatment was successful when the testis occupied an intra-abdominal position. The patient was a boy of 10½ years; he showed certain signs of an endocrine deficiency of the dystrophia adiposo-genitalis type, while there was a history of polydipsia, polyuria, and enuresis. He was treated by daily intramuscular injections of the water-soluble (anterior pituitary-like) fraction of pregnancy urine. After six injections the left testis was found in the inguinal canal, and on the following day the right testis was found to have descended to an appreciable extent. At the same time there was a striking improvement in the development of sex characteristics.

REFERENCES.—<sup>1</sup>*Amer. Jour. Surg.* 1935, xxvii, March, 447; <sup>2</sup>*Endocrinology*, 1932, xvi, Sept., 513; <sup>3</sup>*Ibid.* 1934, xviii, 475.

## TETANUS.

Ivor J. Davies, M.D., F.R.C.P.

Leslie Cole<sup>1</sup> (Cambridge) discusses the treatment of tetanus in a review of 21 cases, and in the same contribution E. T. C. Spooner records his observations on the fate of injected antitoxin. It is suggested that routine treatment should include a single dose of 200,000 units of *antitoxin* given intravenously as early as possible and followed after an interval by thorough treatment of the wound. As liberal a diet as possible should be given and an attempt made to give over 2000 calories per day. The value of avertin in controlling the spasms and giving sleep is emphasized. It was shown that antitoxin disappears from the blood of these patients rapidly at first and more slowly later, and that seven days after the injection about 10 units per cubic centimetre and at the end of fourteen days between 3 and 5 units per cubic centimetre remained. The effects of treatment of three cases with a moderately "lissive" (see below) sample of *curare* are described and the possibilities of this treatment are discussed.

R. West<sup>2</sup> showed that one sample of *curare* removed pathological rigidity in man without causing diminution of voluntary power. This selective action he called "lissive". The prognosis was considered in relation to incubation period and "period of onset". These two factors should be given greater consideration in assessing results and in choosing cases for any new method of treatment such as *curare*.

A list of the wounds causing the disease in this series showed the danger of not giving prophylactic antitoxin in such cases, particularly when there is a history of contamination with earth or when from the patient's occupation such contamination is possible. Prophylactic (antitetanus) inoculation, whose efficacy was abundantly proved during the War, is still unfortunately not yet in general use.

Professor H. W. Florey, H. E. Harding, P. Fildes<sup>3</sup> (Sheffield), working for the Medical Research Council, describe the effects and doses of *curarine* in cats and rabbits. Suggestions for the more adequate treatment of tetanus were made. Their experimental inquiry should be very carefully studied, for the death-rate from tetanus is still extremely high. Owing to the comparative rarity

of the disease it is unusual to find any one medical man with an extensive experience of its treatment. For this reason, these investigators suggest that the first essential is to establish some suitably equipped centre of treatment which would draw cases from a wide area. A centre of this description would enable the merits of various forms of treatment to be adequately investigated in a relatively short space of time and enable a staff to be trained in the procedures necessary. Until the time when such centres are available, they outline a scheme of treatment which might lead to the saving of some lives.

R. H. Miller and H. Rogers<sup>4</sup> (Boston) furnish a report of further cases of tetanus from the Massachusetts General Hospital, where since 1896, when antitoxin was first used, the mortality has declined from 80 to less than 47 per cent. Prophylactic injection of antitoxin (1500 units) is indicated in cases of deep or puncture wounds that may be contaminated. In unusually complicated cases this should be repeated once or even twice at intervals of ten days. Undoubtedly the one factor that will further lower the death-rate is the more universal use of prophylactic antitoxin. This fact was well shown in the War, when the mortality of tetanus following wounds fell to 33½ per cent. As soon as the diagnosis is made, serum should be given intravenously, intramuscularly, or both, in daily doses of from 20,000 to 80,000 units up to a total of 300,000 units. There are no theoretical or practical grounds for the recommendation of the intraspinal administration of antitoxin. This paper gives a good clinical account of the disease and its treatment.

J. S. Mitchell<sup>5</sup> (Cambridge) reports a case of tetanus successfully treated with curarine at the Birmingham General Hospital. A sterile solution of curarine hydrochloride (free from curine) containing 1 mgrm. in 1 c.c. was freshly prepared every few days and was given subcutaneously. It now appears to be accepted that curarine is the most suitable alkaloid of its group for use in the treatment of tetanus, but there is no unanimity as to the dosage and the details of administration.

REFERENCES.—<sup>1</sup>*Quart. Jour. Med.* 1935, iv, July, 295; <sup>2</sup>*Proc. Roy. Soc. Med.* 1932, xxv, 39; <sup>3</sup>*Lancet*, 1934, ii, Nov. 10, 1036; <sup>4</sup>*Jour. Amer. Med. Assoc.* 1935, civ, Jan. 19, 186; <sup>5</sup>*Lancet*, 1935, i, Feb. 2, 262.

## TETRA-ETHYL LEAD ENCEPHALITIS.

Macdonald Critchley, M.D., F.R.C.P.

Although rare, poisoning from exposure to tri- or tetra-ethyl lead is notoriously dangerous. The occurrence of cerebral symptoms is striking, and led to the nickname 'looney gas', which has been applied in the States to ethyl petrol. The earliest cases were recorded in 1922, and in the following year an outbreak of this form of poisoning occurred in the du Pont and the Standard Oil Works in New Jersey. In view of the world-wide alarm which was aroused over the possible fear of a wholesale intoxication from ethyl petrol fumes, a commission of investigation was set up by the United States Public Health Service<sup>1</sup> and by a British Departmental Committee.<sup>2</sup> The problem has also received the attention of a considerable research at the hands of R. A. Kehoe and his associates.<sup>3-8</sup> Two main questions are concerned: (1) The possible dangers attendant upon the use of ethyl petrol ('leaded gasoline') to motorists, petrol distributors, garage mechanics, and to the community at large. (2) The vital hazards entailed by the manufacture and handling of tetra-ethyl lead.

1. The problem is a very far-reaching one, for the opportunities for exposure to lead in petrol are very diverse, as Kehoe has well shown. Ethyl petrol is handled at refineries, bulk storage plants, filling stations, and garages. It may be handled during transport, and particularly by the retailer by reason

of spillage. Inhalation may occur not only of the fumes of ethyl petrol but also of the dust which accumulates after repeated spillage. Deposits of lead may occur at the sides of the petrol tanks and lead to opportunities for absorption of lead by the lungs or through the skin. A further possible source of hazard occurs after combustion, and garage mechanics may absorb lead either by inspiring exhaust fumes or by handling carburettors contaminated with deposit. Lastly, there is the hypothetical risk to the general population through contamination of the atmosphere by lead-containing exhaust gases.

The report of the British Ministry of Health (1930) agrees with that of the U.S. Government Committee, that the widespread use of ethyl petrol does not constitute a risk, either by reason of atmospheric contamination or through absorption by way of the skin. Nevertheless they made certain recommendations, limiting the proportion of lead tetra-ethyl, and suggesting that the petrol should be dyed. A more recent and detailed report by R. A. Kehoe, F. Thamann, and J. Cholak<sup>9</sup> has also confirmed these findings; they examined 301 men who had incurred severe and prolonged exposure to ethyl petrol. No clinical evidences of lead absorption or lead intoxication could be detected.

2. The problem is otherwise in the case of those handling tetra-ethyl lead. This is a heavy oily liquid which rapidly penetrates the unbroken skin. (When diluted in petrol, its absorption is very greatly retarded). Its toxicity is very high, and at ordinary temperatures air saturated with its vapour contains 5 mgrm. of lead per litre, a concentration which is lethal for rabbits in a few hours. Sunlight has the property of decomposing tetra-ethyl lead to crystalline tri-ethyl compounds. These readily form a dust-hazard. A special ritual of safety-measures and of equipment has therefore become necessary for those engaged in the manufacture of tetra-ethyl lead.

**SYMPTOMS.**—The symptoms of tri- and tetra-ethyl lead poisoning differ from the more usual types of plumbism; thus the peripheral manifestations are not present; lead colic, Burton's blue-line, and wrist-drop do not occur, and stippling of the red cells does not appear until very late. According to a recent study by W. F. Machle,<sup>10</sup> symptoms may appear within one to three hours of exposure. More often, however, there is a delay of from eighteen hours to eight days before the development of acute manifestations. During this time prodromal symptoms may occur. These comprise: Insomnia, which is invariably present, the sleep being difficult, restless, and interrupted by terrifying dreams; a pale and anxious appearance; excitement, nervousness, and irritability; headache and vertigo. The cerebrospinal fluid pressure at this stage is raised. Anorexia, nausea, and vomiting are frequent; diarrhoea is commoner than constipation. Muscular weakness and fatigability are common, and tremor may be present. The reflexes are usually brisk.

In milder cases improvement may occur within a few days, leading to a cure at the end of two to three weeks.

With severer cases the symptoms are present in greater intensity and the clinical picture may be dominated by the psychological disorders. Thus manic, delirious, or confusional states may supervene. Kehoe has drawn attention to a frequent mental state, which is reminiscent of delirium tremens, the patient being restless, talkative, and hallucinated.

Amongst the cardiovascular symptoms, hypotension and bradycardia are to be noted, associated with subnormal temperatures.

A recent interesting case of encephalitis due to tetra-ethyl lead has been reported by Bowman and Howard.<sup>11</sup> The patient, aged 40, had been working for the previous year for an oil company, his job being that of cleaning petrol tanks, removing the crust or scale from the sides. He began to complain of headache, sleeplessness, great fatigue, and loss of weight. A few days later

he collapsed at work; the same occurred the next day. The day after that he was confused and gradually he became restless and forgetful. On admission to hospital he lay in bed, rolling his head from side to side, sweating profusely. Gradually he became almost comatose, no reflexes being obtainable. The temperature rapidly rose, but later fell by crisis. This was accompanied by a general improvement, the memory defect persisting for some time however. Neurological examination showed a coarse tremor of the hands, arms, and head, and fine tremors about the mouth. None of the characteristics of lead poisoning could be detected.

REFERENCES.—<sup>1</sup>J. P. Leake et al. *U.S. Pub. Health Bull.* No. 163, 1927; <sup>2</sup>*Final Report of the Departmental Committee on Ethyl Petrol*, Ministry of Health; <sup>3</sup>*Jour. Lab. and Clin. Med.* 1927, xii, 554; <sup>4</sup>*Amer. Jour. Hyg.* 1931, xiii, 478; <sup>5</sup>*Jour. of Indust. Hyg.* 1933, xv, 306; <sup>6</sup>*Amer. Jour. Pub. Health*, 1928, x, 555; <sup>7</sup>*Jour. of Indust. Hyg.* 1933, xv, 273; <sup>8</sup>*Ibid.* 257; <sup>9</sup>*Ibid.* 1934, xvi, 100; <sup>10</sup>*Jour. Amer. Med. Assoc.* 1935, Aug. 24, 578; <sup>11</sup>*Arch. of Neurol. and Psychiat.* 1935, xxxiv, 232.

### THERAPEUTICS. (See also URINARY THERAPEUTICS)

Philip Hamill, M.D., D.Sc., F.R.C.P.

**Dosage and Susceptibility.**—The question of dosage and of the varying susceptibility of individuals to the influence of drugs is a matter of great interest. Work on the biological standardization of drugs clearly establishes that even in closely inbred animal stocks there are apt to be considerable individual variations of tolerance. The variation is greater in animals derived from different stocks, and is likely to be even greater in human beings of different family, sex, and age. Hence it is important when using heavy doses or potent remedies to choose drugs which have a high ratio of toxic to therapeutic dose or to which it has been proved that individual variation in susceptibility is very much limited. Neosphenamine and digitalis are good examples; for the former the ratio of toxic to therapeutic dose is high, and towards the latter individuals show a remarkable uniformity of susceptibility.

These considerations are of special importance in relation to drugs used for basal anaesthesia. The lethal dosage of many drugs for man is happily still uncertain. Where there is evidence of considerable individual variation in response to a drug it is important to keep well within safe limits. The great advantage of the volatile anaesthetics is that the dosage can readily be adjusted to the needs of the moment and of the individual. (A. J. Clark.<sup>1</sup>)

**Fluids.**—The administration of fluid in cases of dehydration has attracted much attention. In general, when the patient can swallow, the oral route is preferable. The rectum can absorb water and saline solution speedily, though it is suggested that the addition of dextrose is undesirable on the ground that little, if any, is absorbed, and that it tends to produce distension. (Macnab and Scarlett.<sup>2</sup>) For intravenous administration the continuous drip method is the best. Though isotonic sodium chloride is satisfactory, it is often preferable to supply the other important salts which are found in Ringer's solution. In this solution the proportion of sodium bicarbonate is less than in normal plasma, for larger proportions would cause precipitation of calcium. Sodium lactate can be added to Ringer's solution and acts as satisfactorily as extra bicarbonate. In general, Ringer's solution, with or without the addition of sodium lactate, and dextrose are the most generally valuable solutions for intravenous use, though gum saline solution is valuable when the blood volume has been reduced by hæmorrhage or shock and a blood transfusion is not immediately available. (Hartmann.<sup>3</sup>)

Dextrose is of great value, not only as a food which is readily absorbed, but also for its protective action on the liver in cases where this is affected in disease and likely to be the subject of surgical operations. Whether, in fact, dextrose

is more quickly absorbed than cane sugar when taken by the mouth is not certain. Against its higher cost may be offset its less cloying sweetness when administered in large doses.

**Oxygen.**—Oxygen administration is a valuable therapeutic measure. Efficient concentrations in the alveolar air can be obtained only by the use of closed systems such as the oxygen tent or by the nasal catheter with a corresponding high consumption of oxygen. The nasal route needs for prolonged administration efficient humidifiers, but if these are available it is fairly well tolerated. Its chief disadvantage is the high oxygen consumption; 8 to 10 litres per minute are usually required—corresponding roughly to 16 to 20 c. ft. per hour. Such rates, though tolerable in institutions where large cylinders and suitable trolleys are available, are highly inconvenient in a private house. To manipulate a 40-ft. cylinder is about the limit of a nurse's strength, and at these rates the cylinder would have to be changed every two to two and a half hours. The oxygen tent, after its first filling, is much more economical in consumption, though needing more skill in its supervision. For patients who are delirious it is rather more alarming. The advantages and disadvantages of the two methods are perhaps fairly equally balanced.

**Action of Drugs at Nerve Endings.**—In his Dixon Memorial Lecture Sir Henry Dale<sup>4</sup> traced the development of modern ideas of the mode of action of drugs at nerve endings and the transmission of nervous impulses, and the functions of adrenalin and acetylcholine in the animal economy are now clarified. In connection with these studies two recent advances may be considered.

*Curare* has many times been used therapeutically in cases of tetanus to block the excessive impulses from the affected spinal cord before they reach the muscles. Ranyard West<sup>5</sup> has made an extensive study of the action of curare and its alkaloids, and has used them not only for the treatment of tetanus, but also to diminish the rigidity of muscles in cases of spastic paraplegia. His results are distinctly encouraging.

**Physostigmine.**—Walker<sup>6</sup> tried the effect of physostigmine on cases of myasthenia gravis and found distinct improvement resulted. The unpleasant side actions on heart and intestine could be to some extent controlled by the simultaneous administration of atropine, but much better results could be obtained by using an artificial alkaloid—prostigmine with atropine. Patients who were wholly bed-ridden and unable to feed themselves were enabled to lead an active existence. The beneficial effects of an injection passed off after some six to eight hours, but could be restored by further doses. Her results have been fully confirmed by others. The drug has proved helpful also in maintaining the nutrition of muscles whose nerve-supply has been impaired by injury, though the results are less striking than in myasthenia gravis. (Hamill and Walker.<sup>7</sup>)

**Ergot.**—There has long been controversy about the active principles of ergot. Laboratory workers stressed the importance of ergotoxine as the active principle, and urged that the B.P. 1914 liquid extract contained none, and hence was worthless. Practitioners disagreed and were satisfied with the clinical efficacy of the preparation. Moir,<sup>8</sup> in 1932, showed clearly that the 1914 B.P. preparation had great activity, and postulated the existence of another active principle not then identified. This has now been isolated by Dudley and Moir,<sup>9</sup> and by them named 'ergometrine'. In doses of 0.5 to 1 mgrm. by mouth ergometrine produces strong uterine contractions in six to eight minutes. Half these doses intramuscularly produce contractions in three or four minutes. Whether ergometrine is the sole highly effective constituent is not yet clearly established. It is probable that it is identical or almost identical with certain other alkaloids recently isolated from ergot. Such a quick-acting and reliable



derivative of ergot is a most valuable addition to gynaecological and obstetric therapeutics.

**Dinitrophenol.**—Though there have been a number of cases reported in which unpleasant symptoms or unfortunate incidents have occurred in the use of dinitrophenol for weight reduction in obesity, there have been numerous studies of its action. Two papers may be mentioned. Stocton and Cutting<sup>10</sup> have studied the circulatory effects of the drug in normal persons. They found no very great changes in systolic or diastolic blood-pressures. In the majority of cases there was a rise of venous pressure and considerable increase of pulse-rate. There was considerable peripheral vasodilatation with a sensation of warmth and sweating, and the periods of maximum flushing coincided with those of maximum increase in pulse-rate and venous pressure. It is clear that these are compensatory phenomena and they afford some indication of the greatly increased load thrown on the heart.

Salmon,<sup>11</sup> taking care to avoid excessive doses and to exclude obese diabetics, sought for evidence of minor toxic effects, particularly for signs of hepatic and renal insufficiency and of cardiac failure. He failed to find any. His daily dosage did not exceed 25 mgrm. per 10 kilos of body weight, and even in-patients over 100 kilos never exceeded 0.25 gm. He regards the drug as a valuable remedy in the treatment of obesity, especially in cases where for any reason the taking of exercise is not possible. Further, Salmon has confirmed the observations of Vermeylen and Heernu, that, in depressive states, small doses of dinitrophenol not only increase metabolism but also improve appetite and may lead to increase in weight. None the less the drug should not be regarded as one to be used except in special cases, and certainly not as a substitute for a careful dietetic regimen and course of exercise.

**Aspirin.**—The extensive use of acetylsalicylic acid by patients of all ages without medical advice and supervision renders important any investigations on the toxic action of salicylates in medicinal doses, apart from the interest of massive doses taken by accident or with suicidal intent.

A considerable amount of acid may be ingested in a day, leading to depletion of alkali reserves and loss of calcium from the body. Mutch has shown that whereas aspirin itself produces decalcification, calcium aspirin—an unstable salt—may aid calcium absorption and retention. Thompson and Dragstedt,<sup>12</sup> working on dogs, have shown that such toxic symptoms as albuminuria, vomiting, anorexia, and convulsions are delayed or diminished by the simultaneous administration of sodium bicarbonate or calcium gluconate. The effect of calcium was greater than that of sodium; its mode of action is not clear.

**Antipyretics.**—How far do antipyretics do good? Is it desirable to lower temperature, or should a raised temperature be regarded as a beneficial reaction to infections which ought not to be combated? The answer to these questions is still lacking. Though the number of available antipyretics has greatly increased in recent years they are now generally used for their capacity for diminishing discomfort rather than for their action in reducing temperature.

Wyrsh and Bruns,<sup>13</sup> working on artificial fever produced by 'pyrifer' (a protein shock preparation), found that the changes in the blood do not run strictly parallel to the rise in temperature, and that the numerous antipyretics which they employed did not influence the changes in the blood produced by 'pyrifer', though they diminished fever and greatly diminished the discomfort of the patient. The authors regard these results as important because it would appear that all the beneficial effects of artificial fever may be obtained in cases of tabes, neurosyphilis, and arthritis with much less attendant discomfort.

The chief use at the present time of most of the ordinary antipyretics is as 'pain-killers'. For this purpose combinations of barbitone and its derivatives

with amidopyrine and its derivatives have been popular and effective, but many cases of grave toxic effects, with several deaths, from agranulocytosis have followed the prolonged use of preparations containing amidopyrine. Recent poison regulations will restrict their use to legitimate medical purposes.

**Methylene Blue.**—In the treatment of poisoning by cyanides and carbon monoxide, injections of solutions of methylene blue have been strongly advocated, though little is known of its effects on normal persons. Nadler, Green, and Rosenbaum<sup>14</sup> have made some observations on its toxic symptoms and effect on the electrocardiogram. They found changes indicative of some weakening of heart muscle. In addition, there is evidence of cerebral excitement and of gastro-intestinal and urinary irritation—manifested by restlessness, burning sensation in mouth and stomach, pain in the chest, and strangury. A certain amount of hæmoglobin is converted to methæmoglobin, but probably not enough to produce serious effects. The authors suggest that the use of methylene blue may not be free from danger.

**Diuretics.**—The powerful diuretic action of *salyrgan* (*mersalyl*) has proved of enormous benefit to patients suffering from congestive cardiac failure. Numerous studies have been made of its mode of action and comparisons drawn between it and the older diuretics such as caffeine and theobromine. Bouyoucos,<sup>15</sup> working on patients, concludes that the mercurial diuretics act directly on the tissues, mobilizing their content of water and of sodium chloride, but that there is also a direct action on the kidney. Blumgart, Gilligan, and others,<sup>16</sup> working on normal persons and comparing drugs of the salyrgan type with those of the xanthine group, conclude that there is no essential difference in their mode of action. In their view, the cause of diuresis is diminished resorption of the glomerular filtrate in the renal tubules. They found no evidence of augmentation of glomerular filtrate, nor was there evidence of appreciable change of blood chemistry. There was no evidence of kidney irritation. They do not support the view that diuresis is due to reaction of the kidney to mobilization of water and chlorides in the tissues, but rather indicate that the kidney effect is primary and that the migration of fluid and chlorides from the tissues is a consequence of greater kidney output. The diuretic effects of the various drugs studied were similar in kind, differing only in magnitude and duration. Bryan, Evans, and others,<sup>17</sup> working on dogs, confirm their views that there is no evidence of extra-renal action. The action on the kidney is direct.

Stanojevic and Andric<sup>18</sup> favour the use of intravenous injections of *decholin* (a bile-salt derivative) as a diuretic in cases of congestive cardiac failure, especially where there is enlargement of the liver without much general œdema. In their view it has a directly beneficial action on the liver, and this action—as well as its action as a diuretic—is enhanced by the simultaneous injection of 50 per cent dextrose solution. The liver becomes smaller and softer and the patient feels much better.

**Analgesics and Hypnotics.**—The relief of pain is one of the more important functions of the doctor, and closely allied to it is induction and maintenance of sleep. Substitutes for morphine or opium are steadily sought. Attention has been paid to *dihydromorphinone hydrochloride* (*dilaudid*). Many claims have been made for this substance, amongst them that it is less habit-forming than morphine, but it is certainly not free from risk of habit formation. Dilaudid acts more rapidly than morphine, and its effects are more transient; hence, when in cases of inoperable carcinoma it is essential to keep the patient almost constantly under the influence of an analgesic, doses need to be given more frequently than is the case with morphine. For similar efficiency in relieving pain dilaudid has rather less depressant effect on the respiratory

centre, but in susceptible individuals there may be great slowing of respiration. Treatment for this condition is identical with that of morphine overdose. The response to oxygen and carbon-dioxide mixture is satisfactory. (David<sup>19</sup> and Stroud.<sup>20</sup>) The chief undesirable effect of the drug is its tendency to produce itching. The effective dose is about one-eighth that of morphine. Where habituation through long use has occurred character appears to be less affected than is the case in morphine habitués.

For less severe pains there are a larger number of preparations on the market. Many of these contain *amidopyrine* or a derivative and a *barbiturate*. The regulations under the Poisons Act will diminish the facilities for obtaining these substances, which have been shown to produce grave or fatal agranulocytosis in a number of instances. For headaches and pains of only moderate severity a preparation containing *codeine*, *phenacetin*, and *aspirin* has proved itself very satisfactory.

The ideal hypnotic has not yet been produced. The various *barbiturates* have been whole-heartedly commended and equally heartily condemned by various authorities. Truth lies between these extremes. There are undoubtedly those who are susceptible to these drugs or careless in their consumption. Toxic effects (quite apart from suicidal attempts or erroneous dosage) do occasionally occur. The simplest hypnotics, such as *chloral hydrate with bromides*, are of the greatest value in suitable cases. When the barbiturates are prescribed it is important to have regard to the time of administration and to the rate of destruction or excretion of the drug. It is very often better, even in the case of the quick-acting barbiturates, to administer half of the dose some hours before bed-time. The patient is thereby tranquillized and disposed to sleep, so that the second half dose may often not be needed.

Where overdosage has occurred, especially in the case of barbiturates, lung complications are especially to be feared. The stomach should be washed out to remove any unabsorbed drug. Lumbar puncture should be performed if there is coma. Endeavours should be made to hasten the excretion of the drug. Intravenous injections of *dextrose* (5 to 10 per cent) have proved valuable for the purpose and also for protecting the liver from toxic effects of the drugs. Cerebral and medullary stimulants are invaluable; strychnine in large doses, repeated if necessary, is almost a specific. *Coramine*, and its allies, *icoral* and *cardiazol*, are also most valuable.

REFERENCES.—<sup>1</sup>*Edin. Med. Jour.* 1935, lxii, 1, *Lancet*, 1934, ii, 1149; <sup>2</sup>*Canad. Med. Assoc. Jour.* 1934, xxxi, Nov., 489; <sup>3</sup>*Jour. Amer. Med. Assoc.* 1934, Nov., 1349; <sup>4</sup>*Proc. Roy. Soc. Med.* xxviii, 319; <sup>5</sup>*Ibid.* 565; <sup>6</sup>*Lancet*, 1934, i, 1200; <sup>7</sup>*Ibid.* 1935, March 9, *Jour. of Physiol.* 1935, lxxxiv, 36; <sup>8</sup>*Brit. Med. Jour.* 1932, i, 1119; <sup>9</sup>*Ibid.* 1935, i, 520; <sup>10</sup>*Jour. Amer. Med. Assoc.* 1934, ciii, 912; <sup>11</sup>*Presse méd.* 1935, xliii, 341; <sup>12</sup>*Arch. of Internal Med.* 1934, liv, 308; <sup>13</sup>*Munch. med. Woch.* 1934, No. 52, 1999; <sup>14</sup>*Amer. Jour. Med. Sci.* 1934, clxxxviii, July, 15; <sup>15</sup>*Presse méd.* 1935, xliii, 221; <sup>16</sup>*Arch. of Internal Med.* 1934, liv, July, 40; <sup>17</sup>*Ibid.* 1935, lv, May, 735; <sup>18</sup>*Munch. med. Woch.* 1935, lxxxii, 416; <sup>19</sup>*Jour. Amer. Med. Assoc.* 1934, ciii, Aug. 18, 474; <sup>20</sup>*Ibid.* Nov. 10, 1421.

**THROMBO-ANGIITIS OBLITERANS.** (See ARTERIES, PERIPHERAL, DISEASE OF; BLOOD-VESSELS, SURGERY OF.)

## THYMUS GLAND.

Sir Walter Langdon-Brown, M.D., F.R.C.P.

Of late the claims of the thymus to be regarded as an endocrine structure have been discredited, but now there is a reaction. As mentioned in the article on the PITUITARY BODY, thymic growths have produced Cushing's syndrome, and now Hanson's thymus extract has been shown by Rowntree and others<sup>1</sup> to accelerate the growth and development of rats, and to increase their fertility, while hastening the onset of adolescence in the offspring of rats thus treated.

A point of great interest to geneticists is that these observers claim that the injection of succeeding generations of parent rats has resulted in the amplification of the effects of thymus extract. Have we at last, in this handling on of an increasing sensitivity, an example of the transmission of acquired characters?

REFERENCE.—<sup>1</sup>*Jour. Amer. Med. Assoc.* 1934, ciii, Nov. 10, 1425.

### THYROID GLAND.

*Sir Walter Langdon-Brown, M.D., F.R.C.P.*

During the past year the literature on this subject has contained little that is new. There has been a good deal of revision of familiar ground, as well as an increasing claim for the benefits of thyroidectomy in the treatment of congestive heart failure. A good deal of work has also been done on substances antagonistic to thyroxin in the treatment of hyperthyroidism. Perhaps the most interesting pronouncements are those to be found in C. R. Harington's Oliver-Sharpey Lectures<sup>1</sup> on the "Biochemical Basis of Thyroid Function," which is an admirable review of the whole subject. His work on the structural formula of thyroxin and its synthetic production is well known.

**Goitre.**—Harington sums up the position as to the etiology of goitre as follows: It is safe to make the generalization that the immediate cause of all simple goitre is failure of access of a sufficiency of iodine to the thyroid; in endemic goitre this failure is to be ascribed directly to environmental deficiency of iodine; in sporadic goitre either directly to interference with the absorption of iodine or indirectly to the production of a relative iodine deficiency by the imposition of a demand upon the thyroid which, with its available supplies of iodine, it is unable to satisfy. In any case it is certain that no goitrogenic influence is at present known which cannot be antagonized by the administration of extra iodine. An interesting case of a natural antagonism of this sort is afforded by the Eskimos. The Eskimo diet contains a preponderance of fat, and, in view of the experimental production of goitre in animals by such diets, the prevalence of goitre among the Eskimos might be anticipated. In point of fact the disease is unknown among this race, the explanation being that their diet includes a large amount of cod-liver oil, which is rich in iodine.

**Cretinism.**—What has been said concerning the etiology of simple goitre can be applied also to the etiology of cretinism, which must be regarded as the extreme manifestation of the results of iodine deficiency. In its endemic form cretinism is associated only with the most severely endemic goitre, and it is doubtful whether true cretinism occurs outside these special environmental conditions. A congenital disease strictly analogous with human cretinism has not been produced experimentally in animals. In human cretinism of the extreme type, on the other hand, the thyroid at birth has already passed beyond the stage of hyperplasia to that of fibrosis atrophy, so that the disease may fairly be described as prenatal myxœdema. The fact that the thyroid of a cretin has already undergone irreversible pathological change during intra-uterine development is sufficient to explain the relative incurability of cretinism by replacement therapy as compared with the curability of myxœdema in adult life, which involves no more than a retrogression of fully developed physiological functions.

### Hyperthyroidism.

**INCIDENCE.**—Although we are apt to think of hyperthyroidism as confined to the child-bearing period of life, cases do occur both earlier and later than this. H. M. Chute and N. W. Swinton<sup>2</sup> describe a series of cases in women over 60 and claim results by operation as successful as those obtained in younger patients. In the diagnosis of this condition it must be borne in mind, as F. G. Benedict<sup>3</sup> states, that the basal metabolism is normally lowered 1

women over 66 years of age, so that the significance of even a normal basal metabolic rate in masked thyrotoxicosis may be missed. S. Gordon and R. R. Graham<sup>4</sup> also call attention to the occurrence of clinical hyperthyroidism with a normal basal metabolic rate in the older patients.

**ETIOLOGY.**—Harington<sup>1</sup> maintains that the morphological appearance of the thyroid in Graves' disease is similar to that of a thyroid which has undergone hyperplasia in a normal animal as the result of restriction of iodine, and in Graves' disease the thyroid responds to iodine in a similar manner—by involution with storage of colloid. The fundamental difference is the greatly increased rate at which the secretion is poured out in this disease—Kocher's 'thyroid diarrhoea', which is probably due to some extrinsic stimulus acting on the gland. Although the thyrotropic hormone of the anterior pituitary has been shown to be a potential causative agent of Graves' disease, he thinks that it is extremely unlikely that anything so simple as the over-production of this hormone can account for the condition.

**The Cause of Exophthalmos.**—D. Marine and S. H. Rosen<sup>5</sup> have produced exophthalmos experimentally by injecting pituitary extracts and cyanides; they explain this as due to two factors—(1) the supply of more thyrotropic hormone, and (2) the production of a relative thyroid insufficiency. They regard iodine as the logical remedy, but admit the connection between mid-brain lesions and the production of exophthalmos to which various writers have called attention. The association of exophthalmos with a relative thyroid deficiency is rather puzzling on the ordinary views of the etiology of hyperthyroidism. They attribute a share, as others have done, to the adrenals, and I. Bram<sup>6</sup> advocates administration of *adrenal cortex* in certain types of hyperthyroidism, claiming that it particularly relieves the nervousness and liability to fatigue, tachycardia, and raised basal metabolic rate.

**BIOCHEMISTRY.**—Harington finds that a peptide compound of thyroxin is much more active than free thyroxin when given by the mouth, though they are equally efficient on intravenous injection. The whole of the iodine of the gland is not contained in thyroxin, the rest being present as 3:5-diiodotyrosine. He believes that the molecule of the complete active secretion of the thyroid contains both these substances, and that some linkage between them is ruptured during the hydrolysis necessary for the isolation of thyroxin. He is strongly opposed to Möbius' view that Graves' disease is a dysthyroidism rather than a hyperthyroidism. Particularly is it wrong to claim that a compound containing less than the full complement of iodine is more toxic. No one has ever extracted a toxic principle in the glands removed from patients suffering from Graves' disease. Indeed, the full complement of iodine is not necessary for the characteristic physiological response, since 3:5-diiodothyronine will raise the basal metabolic rate (Gaddum) and has considerable therapeutic possibilities without some of the drawbacks of thyroxin.

**BASAL METABOLIC RATE.**—I. M. Rabinowitch<sup>7</sup> is of opinion that the use of pulse-rate and blood-pressure as an index of basal metabolic rate is theoretically sound, and practically useful, since direct estimations of the rate are no more accurate except in well-arranged laboratories.

**RECURRENCE.**—E. H. Pool and J. H. Garlock<sup>8</sup> urge that as thyroidectomy does not eliminate the actual cause of the disease, recurrences are only to be expected if patients are followed for a long period. In 194 cases carefully followed over a period from six months to ten years there was a percentage of 7.7 of recurrences.

#### TREATMENT.

1. **Iodine Therapy.**—Harington is one of those who consider that the real justification of iodine therapy in Graves' disease is its value as pre-operative

treatment; the attempt to use it for prolonged and unaided medical treatment is not only, according to all the evidence, foredoomed to failure, but means the loss of an opportunity to put the patient into the most favourable condition for operation. D. Marine<sup>9</sup> is of opinion that the bad results reported from iodine therapy mainly arise from its use in 'toxic adenomata'—secondary Graves' disease, and not in the primary form. He maintains that the drop in the number of cases coming to operation is evidence of the value of iodine prophylaxis as practised during the last decade.

F. I. McClure and others,<sup>10</sup> while admitting that the rather indiscriminate use of iodized salt in Michigan did at first apparently increase the number of thyroid operations among those suffering from nodular goitre, which had thus become activated, find that since the second year after the introduction of this treatment a notable reduction has occurred in the incidence of endemic goitre. They state that they now see no cases which show the slightest ill effects from the use of iodized salt; presumably because it is given with greater skill and care.

J. H. Means and J. Lerman<sup>11</sup> believe that so-called refractoriness to iodine in thyrotoxicosis is apparent and not real. Thyrotoxic patients who are unaffected by iodine are those who are fully iodinated already. They are accordingly sceptical as to the existence of so-called iodine-Basedowism.

2. *Tyronormon Therapy*.—Tyronormon therapy (see F. Blum,<sup>12</sup> E. Baumann,<sup>13</sup> E. Schneider and E. Widmann<sup>14</sup>) is based on the belief that the blood contains a substance which counteracts thyroxin. This is a catechin which is given as tablets, two or three times a day in milk. Blum's diet is rigidly enforced during treatment—viz., no meat or meat extracts, poultry or fish, strong tea or coffee. Smoking and alcohol are best avoided. Permitted foods are fats of all kinds, eggs, liver and sweetbread, vegetables, cereals, bread, chocolate, honey, with milk up to 1 to 1½ litres daily, and its various products—butter, cheese, and curds. Before beginning the treatment all iodine treatment must be stopped. Rest and elimination of septic foci are requisite in this, as in other methods of treatment. On the same principle animal blood has been used instead of the extracted catechin (E. von Balden,<sup>15</sup> E. Eitel and A. Loeser<sup>16</sup>). M. H. Hoffmann<sup>17</sup> found that the serum lipase of rabbits was markedly reduced after injections of thyroxin, whereas the blood extract containing antithyroidic substances definitely prevented that fall, which suggests that biochemical antagonism exists between such substances and thyroxin.

3. *X Rays*.—E. P. Poulton and W. L. Watt<sup>18</sup> speak very favourably of deep-X-ray therapy in the treatment of Graves' disease. Out of 20 cases 18 showed great and 2 slight improvement. No patients died of the disease, and they maintain that such results compare very favourably with other published results.

4. *Surgery*.—J. M. Graham and H. M. Wallace,<sup>19</sup> revising 125 cases of toxic goitre treated surgically, report 90 per cent of their patients as fit for regular employment. There was a mortality of 3.2 per cent, all in severe long-standing cases. M. M. Lewine<sup>20</sup> records a case of successful treatment of tetany after thyroidectomy by Oppel's method of transplanting a piece of boiled bone under the skin, which acts as a source of calcium salts for the blood.

5. *Various*.—H. Wendt<sup>21</sup> recommends treatment of hyperthyroidism by massive doses of *vitamin A*. P. Starr and H. Patton<sup>22</sup> have observed remissions in hyperthyroidism after treatment by *extract of pregnancy urine*, which they interpret as due to the help thereby given to normal ovarian function. I. Bram recommends *adrenal cortical extract* (see above). (See also SYMPATHETIC NERVOUS SYSTEM, SURGERY OF—DENERVATION OF THE ADRENAL GLANDS.)

**Thyroidectomy in the Treatment of Cardiac Decompensation.**—Considerable interest continues to be taken in this method of reducing the

output of energy demanded from a failing heart, particularly in the United States. Definite statistics are not yet available, but the following references to the treatment are worth consideration.

D. R. Gilligan and others,<sup>23</sup> studying some of the biochemical effects of thyroid ablation in congestive heart failure and angina pectoris, note that the cholesterol content of the blood rises as the basal metabolic rate falls. When it rises to 300 mgrm. the basal metabolic rate is usually - 30 and symptoms of myxœdema become manifest. In conjunction with another group of workers<sup>24</sup> he has studied the effect of this operation on sugar tolerance and the reaction to insulin, and finds that there is no difference in this respect between patients with hypothyroidism and normal individuals. This rather unexpected result leads him to the conclusion that there is no antagonism between the secretions of the normal thyroid and of the pancreas. J. H. Means and J. Lerman,<sup>25</sup> in view of the introduction of thyroidectomy for congestive heart failure, consider it important to study the effect of thyroid administration particularly in the light of the basal metabolic rate. They conclude that  $\frac{1}{2}$  gr. of thyroid U.S.P. daily will maintain the basal metabolic rate of such patients at - 20, which is about the level at which slight symptoms will occur: 1 gr. maintains it at about - 10, while 3 gr. will keep it at the standard level. A patient with cardiac decompensation will stand a drop to - 20 or - 25 without symptoms, and the authors think with benefit. R. M. Wilder and D. L. Wilbur,<sup>26</sup> on the other hand, express the view that the procedure is still on trial and not hastily to be recommended; the surgical mortality is very high.

(See also HEART FAILURE, THYROIDECTOMY IN; THYROID SURGERY.)

REFERENCES.—<sup>1</sup>*Lancet*, 1935, i, 1199, 1261; <sup>2</sup>*Ann. of Surg.* 1935, ci, May, 1181; <sup>3</sup>*New Eng. Jour. Med.* 1935, cxxii, June 13, 111; <sup>4</sup>*Canad. Med. Assoc. Jour.* 1935, Feb., 162; <sup>5</sup>*Amer. Jour. Med. Sci.* 1934, clxxxviii, Oct., 565; <sup>6</sup>*Med. Record*, 1934, cxi, July 18, 67; <sup>7</sup>*Canad. Med. Assoc. Jour.* 1935, xxxii, Feb., 135; <sup>8</sup>*Surg. Gynecol. and Obst.* 1934, lix, Sept., 330; <sup>9</sup>*Jour. Amer. Med. Assoc.* 1935, civ, June 29, 2334; <sup>10</sup>*Ann. of Surg.* 1934, Nov., 924; <sup>11</sup>*Jour. Amer. Med. Assoc.* 1935, civ, March 23, 969; <sup>12</sup>*Med. Press and Circ.* 1935, exc, Feb. 27, 195; <sup>13</sup>*Munch. med. Woch.* 1934, No. 2, 57; <sup>14</sup>*Deut. Zeits. f. Chir.* 1935, cxxiv, 639; <sup>15</sup>*Munch. med. Woch.* 1934, Oct. 5, 154; <sup>16</sup>*Berl. klin. Woch.* 1934, xlii, Dec. 8, 1742; <sup>17</sup>*Arch. of Internal Med.* 1934, liv, Sept., 427; <sup>18</sup>*Lancet*, 1934, ii, Sept. 8, 535; <sup>19</sup>*Brit. Med. Jour.* 1934, ii, Nov. 10, 845; <sup>20</sup>*Lyon chir.* 1934, xxi, 164; <sup>21</sup>*Munch. med. Woch.* 1935, lxxxii, July 19, 1160; <sup>22</sup>*Arch. of Internal Med.* 1935, viii, 825; <sup>23</sup>*Ibid.* 1934, liv, Nov., 746; <sup>24</sup>*Amer. Jour. Med. Sci.* 1934, clxxxviii, Dec., 790; <sup>25</sup>*Arch. of Internal Med.* 1935, Jan., 1; <sup>26</sup>*Ibid.* Feb., 315.

## THYROID SURGERY.

Sir W. I. de C. Wheeler, F.R.C.S.I.

The pre-operative preparation of patients requiring thyroidectomy for hyperthyroidism is the keynote to uniform success. In skilled hands the actual operation carries a negligible mortality. Foci of infection such as are found in the tonsils, teeth, and antra must be sought and dealt with before the major operation is considered. Iodine and rest must be employed until the patient is gaining weight and until emotional instability and muscular weakness are reduced to a minimum. Any attempt to rush operations in order to release beds is followed by an increase in the mortality rate. There is a psychological moment when operation is indicated and safe, and in no circumstances should this period be anticipated.

Some cases do not respond to routine pre-operative treatment. In some of these improvement is noticed after X-ray therapy. This treatment should not be employed more than once a week. At first the symptoms may be aggravated. The best results are not seen until after a lapse of several weeks. Roentgen therapy should be avoided in very bad surgical risks. Preliminary ligation of the superior and inferior thyroid vessels under local anæsthesia occasionally brings about an improvement when iodine therapy and rest have failed.

It is a simple matter to note an increase in the mental quietude, to watch for increase of weight, and to note variations in muscular weakness by testing the quadriceps extensor muscles. Patients with active hyperthyroidism find difficulty in mounting on to a high box or stool in the erect position owing to the weakness of these muscles. By simple clinical observations the rise or fall in the basal metabolic rate as a rule can be foretold.

The steps in the operation of thyroidectomy are described in every modern text-book. The essential points are gentleness in manipulation and scrupulous hæmostasis. A. Rendle Short<sup>1</sup> states that if 20 oz. of blood or more is lost there are definite signs of danger, and if a halt is possible the operation should be discontinued. The actual loss of blood can be ascertained by weighing the swabs before and during operation. An ounce or two is added to allow for blood which has escaped into the sterile sheets. Short emphasizes the care which is necessary in securing vessels in the neck. An extra knot is placed on each ligature, and the patient should be allowed to cough and strain before finally closing the wound. A special nurse should be in attendance for at least twelve hours.

**Less Usual Aspects of Graves' Disease.**—Sir Thomas Dunhill<sup>2</sup> mentions some of the less usual aspects of Graves' disease.

*Graves' Disease in Children.*—Six patients under the age of five years died of the disease in England and Wales, and 47 under the age of fifteen in the years 1911-14. Of his own cases under the age of fifteen, 8 in number, 2 died, 2 were successfully treated by X rays, 2 by arterial ligation, and 2 by operative resection. When operation is undertaken in children as much gland as possible should be conserved. Post-operative hypothyroidism in a child might result in impairment of the mental or physical development.

*Cardiac Complications.*—In reference to cardiac complications Dunhill found that the mortality following operation in cases with auricular fibrillation rose to 7 per cent. The heart rhythm was restored after operation in approximately half the cases, but a large number required quinidine before regularity returned. In the reviewer's experience cases with auricular fibrillation withstood the ordeal of operation surprisingly well, and in the majority rhythm was restored without further treatment.

*Glycosuria* as an additional factor in cases of Graves' disease is alluded to by Dunhill. Medical treatment is obviously indicated before operation. If glycosuria can no longer be controlled with insulin, operation becomes imperative.

*Mental Changes.*—Hyperthyroidism may lead from loss of mental balance to complete mental derangement. Operation is by no means contra-indicated in such cases. Dunhill's figures prove the reverse. Of 10 cases in asylums or mental homes, 7 recovered completely after operation, 3 did not improve, and 1 died. Whatever the result of operation, he is convinced that the mental symptoms are due to the hyperthyroidism. No operation should be undertaken in a case of excessive restlessness. Medical treatment must continue indefinitely; operation is followed by a prohibitive mortality.

**Thyroiditis.**—Acute thyroiditis is frequently mistaken for cellulitis. It should be suspected when the swelling occupies a mid-line position in the lower half of the neck. Cellulitis in this location is most often secondary to an inflamed thyroid. Conservative treatment usually is effective, but suppuration sometimes supervenes and must be treated by operative measures.

**Riedel's Struma.**—This is a comparatively rare condition. It occurs usually in women in the fifth decade. There is as a rule a uniformly smooth enlargement of the gland with a characteristic firm induration producing dyspnoea (woody thyroiditis). The differential diagnosis from cancer, infective thyroiditis,



PLATE LXIX

THE SUPERIOR LARYNGEAL NERVE IN  
THYROIDECTOMY

(C. H. FRAZIER AND W. H. ERB)

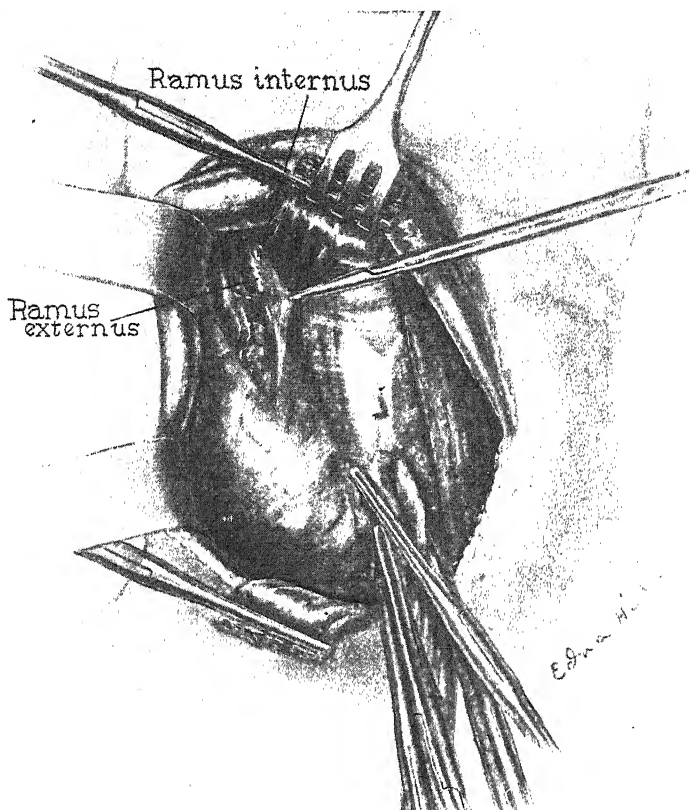


Diagram showing superior laryngeal nerves saved by division of the fascia and exposure of superior thyroid vessels.

*By kind permission of 'Annals of Surgery'*

# PLATE LXX—INTRATHORACIC GOITRE

(F. H. LAHEY AND N. W. SWINTON)



Fig. A.—A diagrammatic illustration of an intrathoracic cyst (degenerated adenoma) which produced the nearest escape from a fatality on the operating table from choking seen in the authors' experience—cyanosis, unconsciousness, and complete absence of air entering lungs. Emergency puncture of the cyst resulted in immediate and complete relief of obstruction permitting deliberate removal of the sac.

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Fig. B.—Showing the typical spherical intrathoracic adenoma of the thyroid with marked deviation of the trachea and narrowing from lateral intrathoracic pressure. Note the normal calibre of the trachea at the level of the upper arrow and the narrowing at the intrathoracic level of the arrow at which narrow point a plug of inspissated mucus may lodge at night and produce choking and the condition described in the text. The inset shows the type of discrete intrathoracic adenoma which also occasionally makes it impossible for a patient to sleep with the head on one side as illustrated.

sypilis, and actinomycosis is often difficult. The regional lymph glands are not enlarged, the Wassermann reaction is negative, the general health of the patient usually is good. David Eisen<sup>3</sup> deals with this interesting disease. The standard treatment is partial resection of both lobes. The operation is rendered difficult by adherence of the mass to muscles and vessels. A small resection is often followed by a large retrogression. The mortality after operation is high (about 6 per cent). Five of 7 cases operated upon by double resection developed hypothyroidism. The subject of Riedel's thyroiditis was discussed in the MEDICAL ANNUAL for 1927 (p. 493).

**Exophthalmos after Operation.**—When recommending operation in cases of Graves' disease the question is constantly asked: Is there improvement to be expected in the 'stare' as a result of surgery? In the experience of the reviewer there has been an improvement in the majority of cases, but this is very gradual and does not keep pace with the disappearance of other signs and symptoms. The prognosis is always doubtful. Nervous symptoms abate, weight is regained, muscular weakness disappears, but the exophthalmos remains. Sometimes there is considerable improvement, but in more than half the cases some of the stare remains.

**The Superior Laryngeal Nerve and the Superior Pole in Thyroidectomies.**—Sir Thomas Myles, of Dublin, emphasized the importance of the superior laryngeal nerve in operations for goitre. His students were taught that consideration of this nerve was almost as important as respect for the recurrent laryngeal. The superior laryngeal nerve supplies the interarytenoid muscles which produce adduction of the posterior ends of the vocal cords. Injury to both nerves may cause partial loss of voice. Injury may also cause loss of sphincteric action of the upper portion of the larynx, allowing fluids to enter the air-passages and thus induce pneumonia.

C. H. Frazier and W. H. Erb<sup>4</sup> emphasize these points. They draw attention to the post-operative accumulations of mucus in the trachea and the painful efforts at expulsion by frequent short coughs. The probable cause of these disturbances is anaesthesia of the larynx and the region of the epiglottis from injury to the superior laryngeal nerve. Loss of sensation abolishes the cough reflex. Pain on swallowing is also a common sequela of thyroidectomy. This is probably due to injury of the inferior constrictor of the pharynx and the sternohyoid muscles. Frazier and Erb ask the question: How can one ligate the vessels of the superior pole and not injure the superior laryngeal nerve, either its external or internal branch? This can be accomplished if traction or rough manipulation of the pole itself or the structures to the inner side of it is avoided. With adequate exposure the skin and platysma should be elevated to the upper level of the thyroid cartilage. The ribbon muscles are divided and the wound edges widely retracted. When the pole is clearly in view the pretracheal fascia is divided. The artery and veins are ligatured and the nerve escapes injury. *Plate LXXIX* shows how easily the external branch of the nerve can be caught or injured if the vessels are not clearly exposed.

**Intrathoracic Goitre.**—This condition should be borne in mind in obscure cases of asthma and dyspnoea or signs suggestive of mediastinal tumour. A tumour of the thyroid entirely extrathoracic may in time become entirely intrathoracic. The gland is in constant movement during the act of swallowing and lies in relationship to the pretracheal and prevertebral fascia. The pre-thyroid muscles to some extent restrict bulging of the enlargement forwards. The line of least resistance is often in the direction of the superior mediastinum. During development the thyroid descends from the base of the tongue. Uncontrolled descent may lead the thyroid to an abnormally low level. F. H. Lahey and N. W. Swinton<sup>5</sup> deal with these problems. They do not favour the theory

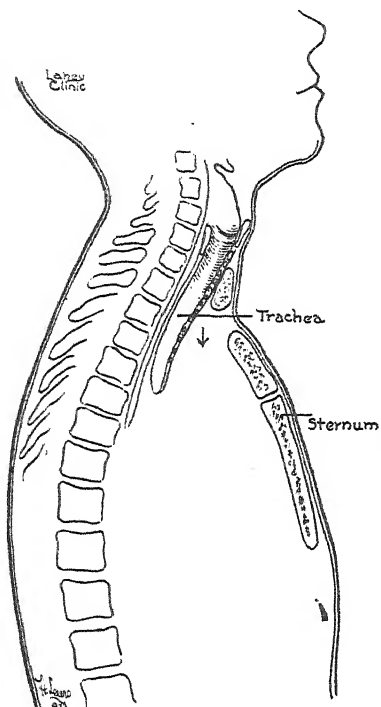
of an excessive developmental descent of the gland. When an adenoma has passed the upper thoracic aperture it can only increase in size by descending further. The tapering of the chest towards the neck (*Fig. 69*) favours descent for an enlarging adenoma or cyst. These writers have not seen a case of hyperthyroidism in association with intrathoracic goitre. They mention a case of impending disaster from choking due to an intrathoracic thyroid cyst (*Plate LXX, A*). For practical purposes all intrathoracic goitres are adenomatous in origin.

**CLINICAL SIGNS.**—Pressure on the trachea and internal jugular veins is a constant sign. The recurrent laryngeal nerve is never involved unless malignant changes have supervened in the growth.

Tracheal pressure is so gradual that patients become accustomed to a diminished space for air intake and also to the associated stridor. Occasionally the patient complains of attacks of suffocation during sleep. Dilatation of the superficial thoracic veins is common. Thickening of the skin over the face is another occasional sign. This is due to oedema resulting from interference with the return of venous supply from the head. Lahey and Swinton state:—

“Complete or incomplete intrathoracic goitre of any extent is rarely seen without dilatation of the superficial thoracic veins. The dilatation varies with the amount of pressure exerted by the goitre on the internal jugular system and the amount of interference with the return blood-supply from the head; compensatory dilatation of the superficial thoracic venous system is established to take up the work of the obstructed internal jugulars. Therefore, the presence of a mediastinal lesion should always be suspected in the presence of dilated, superficial thoracic veins.

“Another clinical feature occasionally seen should make one suspicious of intrathoracic goitre and that is the thickening of the skin over the face, due to oedema resulting from interference with the return of venous supply from the head. We have seen a few patients



*Fig. 69.*—Note the taper of the chest as seen in lateral silhouette, showing how increase in diameter of a spherical adenoma causes it to descend further into the mediastinum. (By kind permission of 'Surgery, Gynecology and Obstetrics'.)

who have had a definite puffiness of the face which was immediately relieved on the removal of the intrathoracic masses.

“Another complaint associated with intrathoracic goitre, particularly when the adenoma is located laterally in the chest, as shown in *Plate LXX, B* and inset, is that the patient is able, for example, to sleep with the right side of his head on the pillow but cannot sleep with the left side of his head on the pillow, or vice versa. This is due to the fact that the trachea is collapsed laterally, and when the head is angulated, as shown in *Plate LXX, B* inset, the trachea

closes even more closely and thus obstruction to respiration is produced, causing the patient to choke, wake up, and change his position."

**Heart Disease and Thyroidectomy.**—One of the most interesting developments in the surgery of the thyroid is the improvement in cases of angina pectoris and congestive heart failure after removal of the gland. The secret of success lies in the proper selection of cases, and it will take some time before physicians feel justified in recommending thyroidectomy in the early stages of an incurable disease. The subject is still in its infancy. The idea of removing the thyroid gland completely in cases of failing heart had its birth in the fact that the greater the metabolic rate the greater the demand on the heart. By lowering the basal metabolic rate the amount of work performed by the heart is lessened. In myxoedema the velocity of the blood-flow is reduced by approximately 50 per cent.

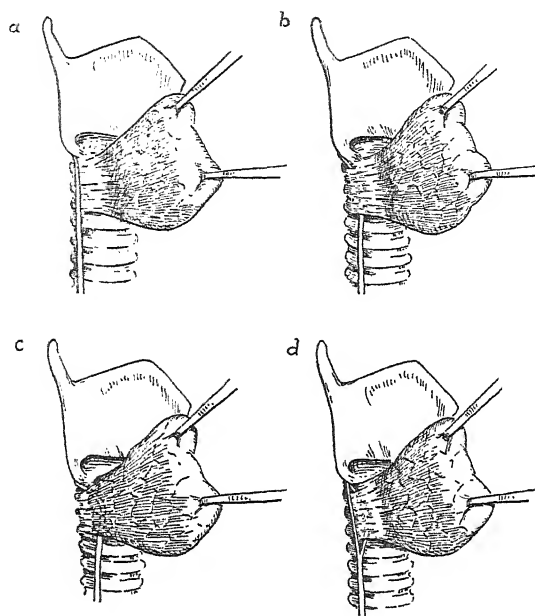
E. C. Cutler and Max T. Schnitker<sup>6</sup> discuss thyroidectomy for angina pectoris. They emphasize the fact that subtotal thyroidectomy only brings temporary relief. It was, however, this temporary relief obtained by partial operation in the earlier cases which encouraged surgeons to undertake the complete operation. An interesting observation is made by the authors—namely, that in cases of angina pectoris before operation an injection of adrenalin brought on a severe attack within twenty-four hours; after operation pain did not result or was greatly modified when an injection was given. They doubt if the relief given to patients with angina by removal of the thyroid is due to the lowered metabolic rate and the reduction of work thrown upon the heart. The effect of operation is too immediate for this explanation to hold good. These writers consider that the two chief complications of total thyroidectomy are injury to the recurrent laryngeal nerves and parathyroid deprivation. Twenty-nine patients were submitted to total thyroidectomy for angina pectoris. They all suffered from the more severe form of the disease: 21 patients showed improvement. Cutler and Schnitker come to the following conclusions:—

"Total thyroidectomy produced a reduction in pain disproportionate to the depression of the basal metabolic rate. This fact, coupled with the immediate and dramatic relief, the skin temperature changes, the effect of adrenalin before and after operation in the production of experimental angina pectoris, the known relationship between the thyroid, the adrenal, and the sympathetic system, suggests that adrenal secretion is an important factor in the attacks of angina pectoris.

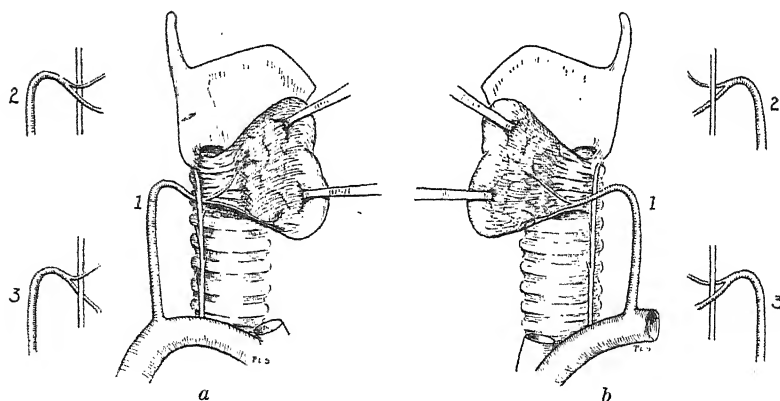
"How total thyroidectomy shifts the adrenal effect is not known, but since the cardiac innervation is intact and thyroidectomy does not decrease the output of adrenalin we have proposed that the effect is produced locally and the cardiac mechanism rendered less sensitive to this hormone."

It is surprising, in view of the known effects of hyperthyroidism on the cardiac mechanism, the familiar myocardial failure in neglected cases of toxic adenoma, the auricular fibrillation so common in Graves' disease, and the relief afforded even to water-logged patients by thyroidectomy, why the operation under discussion was not practised in cases of heart disease many years ago. Only by tottering steps, however, does science advance, says G. H. Pratt,<sup>7</sup> when discussing complete thyroidectomy in advanced heart disease. He has performed the operation on 19 patients. He states that the results have been excellent. Full details are given, and special mention is made of pre-operative and post-operative treatment. This paper teaches the lesson once again that to obtain good results in major surgery the most meticulous personal care must be given to the patient before and after operation. The reviewer has frequently pointed out that a good operator is not necessarily

a good surgeon—in fact, a good operator may be a menace to the science of surgery. Pratt summarizes his paper as follows: (1) The development of complete thyroidectomy for heart disease is traced. (2) Suggestions are made for the extension of the procedure to the arteriosclerotic, renal, and syphilitic



*Fig. 70.*—Variations in the course of the recurrent laryngeal nerve: *a*, In tracheo-oesophageal sulcus; *b*, Through adherent zone; *c*, Partially penetrating gland; *d*, Division of nerve.



*Fig. 71.*—Variations in the relationship between the nerve and inferior thyroid artery. *a*, Right side; 1, Nerve anterior to artery; 2, Nerve posterior to artery; 3, Nerve passing between terminal branches. *b*, Left side: 1, Nerve anterior to artery; 2, Nerve posterior to artery; 3, Nerve passing between terminal branches.

(Figs. 70 and 71 by kind permission of 'Surgery, Gynecology, and Obstetrics'.)

groups, with the presentation of case summaries. (3) A routine pre-operative, operative, and post-operative regime is detailed. (4) Results in 19 patients are presented. (5) The potential dangers are emphasized. (6) A suggestion is made for more complete thyroidectomies routinely.

(See also HEART FAILURE, THYROIDECTOMY IN; THYROID GLAND—THYROIDECTOMY IN THE TREATMENT OF CARDIAC COMPENSATION.)

**The Recurrent Laryngeal Nerves in Total Ablation of the Normal Thyroid Gland.**—All writers stress the danger to these nerves during the operation of total thyroidectomy. D. D. Berlin<sup>8</sup> states that in 10 per cent of the cases the nerve is found partially penetrating the gland, more frequently on the right side than on the left. It must be dislodged by blunt dissection from its surrounding bed of glandular tissue. In about 25 per cent the nerve traversed what Berlin describes as the adherent zone. After mobilization of the lobe by ligature of the main arteries and lateral veins traction reveals the pronounced fixation of the gland to the trachea. The nerve is concealed in this region beneath a stratum of fascia and fatty tissue. By careful blunt dissection the nerve can be seen and preserved from injury. In 65 per cent the nerves were found coursing safely in the tracheo-oesophageal sulcus. The cartilaginous prominence of the inferior cricothyroid articulation is a valuable surgical landmark for identifying the recurrent nerve as it enters the cavity of the larynx. The nerve passes posteriorly to this articulation. Occasionally the nerve divides into two twigs (*Fig. 70,d*). The variations in the relationship between the nerve and inferior thyroid artery are shown in *Fig. 71*.

**End-results of Thyroid Surgery.**—C. H. Frazier and J. Johnson<sup>9</sup> discuss the end-results of thyroid surgery, and give the following summary. "(1) The end-results of 467 cases of diffuse toxic goitre and 163 cases of nodular toxic goitre have been reviewed. (2) In the series of diffuse toxic goitres there was residual toxicity in 6.6 per cent, and recurrent toxicity in 3.4 per cent of the cases, giving a total post-operative hyperthyroidism of 10 per cent. (3) Re-operation was performed or advised in 2.1 per cent of the diffuse toxic goitre series. (4) With a reasonable amount of co-operation on the part of the patient with diffuse toxic goitre, complete relief of thyrotoxicosis may be expected.

**Hyperthyroidism in Pregnancy.**—Normal hyperfunction of the thyroid in pregnancy may be followed by true hyperthyroidism. Pregnancy may also be the determining factor in lighting up quiescent Graves' disease. F. A. Bothe<sup>10</sup> thinks that the increased activity of the gland in pregnancy should be classified into physiological and pathological. A study of the degree of activity should be made in all cases of pregnancy exhibiting toxic symptoms which do not respond to accepted therapeutic measures. Formerly the interruption of pregnancy was advised in the presence of severe hyperthyroidism. Miscarriages were common. Thyroidectomy should be advised unless the condition is well controlled within a fortnight of the administration of *Lugol's solution*. In severe cases operative treatment should be adopted when conditions are favourable after the administration of the iodine solution.

**Cancer of the Thyroid.**—In the early stages there are no signs or symptoms which are positive and diagnostic. The persistent growth of an adenoma with increasing fixation to the surrounding structures should arouse suspicion. In Riedel's struma (so often mistaken for cancer) the tumour is bilateral as a rule, it is smooth and of stony hardness. Paralysis of the recurrent laryngeal nerve does not occur. Occasionally bone metastases may be the first indication of thyroid cancer. In this respect the thyroid resembles the prostate gland.

H. M. Clute<sup>11</sup> writes an interesting paper on this subject. One patient with cancer of the thyroid was only 9 years of age. He mentions other cases under 20; 16 per cent were under 31 years of age.

J. de J. Pemberton<sup>12</sup> recommends a *combination of radiation and surgery* in treatment of cancer of the thyroid. The presence of distant metastasis should not necessarily be construed as a contra-indication to operation for removal of an encapsuled and obstructing malignant adenoma. There is a tendency for metastatic malignant tissue to undergo marked differentiation, a single metastatic tumour may not seriously impair the health of the patient for years. Sarcoma of the thyroid is very rare, the prognosis is hopeless. Adenomatous goitre is a precursor of malignancy in a high percentage of cases. This factor should be considered in every case of nodular goitre. In the *Mayo Clinics*, 1931 (p. 583), it is stated that irradiation only is a poor policy unless the growth is so extensive as to be totally inoperable. Surgery only is not justifiable even if the carcinoma is entirely removed. The growths, as a rule, are radiosensitive and post-operative treatment by radiation is strongly indicated.

J. de J. Pemberton<sup>13</sup> also gives a very full account of the methods of treatment to be adopted in cases of carcinoma of the thyroid gland. He mentions that 2 patients with carcinoma were less than 10 years of age and 9 others less than 20. The total number of cases under review was 658. It is probable that malignancy was superimposed upon benign goitres in 87 per cent of the cases. As a rule, a clinical diagnosis of malignancy can only be made after the growth has perforated the capsule of the gland and invaded the surrounding tissues. Operability depends on the extent of the local lesion and the absence of distant metastasis. Tumours which are completely fixed to all the contiguous structures should not be operated on, otherwise exploration is justifiable, and often the tumour can be removed in its entirety. Even when the tumour cannot be removed completely, radium can be applied to the small fragment of carcinoma that is left attached. The appearance of enlarged lymph nodes months or years after removal of a carcinomatous thyroid is not so significant as when they appear after operation for carcinoma elsewhere. Surgical removal offers a reasonable chance of cure. Even in the presence of metastases in the bones or lungs, if the goitre is causing tracheal obstruction operation should be recommended. Instant relief is obtained, and the patient may live to enjoy many years of useful life. It is important to note that metastatic malignant thyroid tumours may undergo such differentiation that they simulate benign growths. It should also be noted that during the removal of a carcinomatous thyroid gland it is usually unnecessary to remove the adjacent lymph nodes unless they are obviously involved. Inoperable carcinomata are radiosensitive, and should be treated by combined radium and Roentgen therapy.

T. A. Shallow, W. T. Lemmon, and Eli Saleeby<sup>14</sup> come to the following conclusions in dealing with the question of malignant disease of the thyroid: (1) Metastases occur relatively late in thyroid malignancy; (2) Sarcoma holds a place as a pathologic entity; (3) When the disease is limited to the gland and adjacent lymphatics surgical treatment should be instituted. They deprecate protracted medical treatment of thyroid adenoma.

(See also, for treatment of hyperthyroidism, SYMPATHETIC NERVOUS SYSTEM, SURGERY OF—DENERVATION OF THE ADRENAL GLANDS.)

REFERENCES.—<sup>1</sup>*Brit. Med. Jour.* 1935, i, Feb. 2, 202; <sup>2</sup>*Bristol Med.-Chir. Jour.* 1934, ii, Autumn, 155; <sup>3</sup>*Canad. Med. Assoc. Jour.* 1934, Aug., 144; <sup>4</sup>*Ann. of Surg.* 1935, June, 1353; <sup>5</sup>*Surg. Gynecol. and Obst.* 1934, lix, Oct., 627; <sup>6</sup>*Ann. of Surg.* 1934, Oct., 578; <sup>7</sup>*Amer. Jour. Surg.* 1935, xxviii, 85; <sup>8</sup>*Surg. Gynecol. and Obst.* 1935, Jan., 19; <sup>9</sup>*Ann. of Surg.* 1935, May, 1195; <sup>10</sup>*Ibid.* Jan., 422; <sup>11</sup>*Surg. Gynecol. and Obst.* 1935, April, 861; <sup>12</sup>*Mayo Clinics*, 1934, 465; <sup>13</sup>*Ann. of Surg.* 1934, Nov., 906; <sup>14</sup>*Ibid.* 1935, May, 1190.



**TOBACCO AMBLYOPIA.***Sir Stewart Duke-Elder, M.D., F.R.C.S.*

As long ago as 1901 Parsons suggested that one of the factors causing the amblyopia following excessive use of tobacco was the vasoconstrictive effect of nicotine; others have cited degenerative changes in the ganglion cells as the underlying cause; but in both cases little has been done in the direction of therapeutics apart from the advice to abstain from alcohol and tobacco and the empirical administration of strychnine. More recently, Pflimlin, Duggan, and Turtz used vasodilators in the form of *sodium nitrite* in twenty-three cases of amblyopia due to tobacco and alcohol, with almost uniformly good results.

R. Pflimlin,<sup>1</sup> who reported 15 cases of toxic amblyopia in 1930, found a systolic blood-pressure of 180 mm. of mercury or more in the majority of his patients. He suggested that arterial spasm is an important factor in the development of such amblyopia and treated his patients with intravenous injections of a vasodilating agent consisting of inorganic salts, among them sodium nitrite, in an isotonic solution of sodium chloride. All his patients improved. Fifteen of the thirty eyes treated obtained vision of 20/30 after the use of an average of twelve injections over a period of five and two-tenths weeks. The rapidity of improvement or cure was the outstanding feature in all the cases. He believed that abstinence alone is not sufficient to effect a cure or even much improvement in many of the long-standing cases. One of his patients improved under treatment with the aforementioned vasodilating agent in spite of the continued use of tobacco and alcohol.

W. F. Duggan<sup>2</sup> in 1932 reported 6 cases of toxic amblyopia in which the patients were treated with daily intravenous injections of a solution of sodium nitrite. On each of the first three days 40 mgrm. of the sodium nitrite solution was given. For the remaining injections 100 mgrm. a day was used. From six to fifteen injections were given. Eight of the twelve eyes obtained vision of 20/30 or better within from three to fourteen days. Two eyes required five weeks to obtain maximum improvement. Two eyes remained unchanged. The visual fields showed correspondingly rapid improvement in the scotomas.

More recently still, F. C. Cordes and D. O. Harrington<sup>3</sup> have had a similar experience. Of their 8 patients, 6 received daily subcutaneous injections of a vasodilating agent consisting of inorganic salts, among them sodium nitrite, in an isotonic solution of sodium chloride. The dose was 100 mgrm. in 1 c.c. of the solution, and the number of injections was determined entirely by the patient's response. One patient received twelve subcutaneous injections of the sodium nitrite solution, and then, because of inability to report for daily injections, was given 1.5 gr. (0.09 grm.) a day of *erythrol tetranitrate* by mouth. The eighth patient received only erythrol tetranitrate by mouth.

The only evidence of a disagreeable effect of these drugs was a complaint by one patient of attacks of abdominal pain coming on shortly after the ingestion of a tablet of erythrol tetranitrate and lasting for from one half to three-quarters of an hour, and by another of headache following the ingestion of such a tablet. In every case there was much more rapid improvement in vision than would have been expected with abstinence alone. In some cases the amount of visual improvement was almost as remarkable as its rapidity. As a therapeutic test, the results obtained with these drugs seem to substantiate the argument that tobacco is a vasoconstrictor, and that the primary etiologic factor in amblyopia due to tobacco and alcohol is spasm of the blood-vessels.

They conclude that the vasodilating drugs are of definite value in the treatment of the toxic amblyopias caused by tobacco and alcohol, accomplishing in many cases remarkably rapid and complete return of vision.

A paper on the same subject is contributed by W. F. Duggan,<sup>4</sup> who employed sodium nitrite in the form of intravenous injections of *nitroscleran*, wherein

are given the results of treatment in 24 cases of tobacco amblyopia without optic atrophy, described at length. Two patients were relatively unimproved and 1 patient who was showing improvement failed to return after six days. The remaining 21 patients (87.9 per cent) attained vision of 20/30 in one or both eyes in an average time of eighteen and four-tenths days, having received an average of nine injections in fifteen days. Five of these patients smoked during part or all of their treatment. Their average time of improvement was thirty-six and two-tenths days. In the 16 cases in which the patients did not smoke the average time for similar improvement was eleven and nine-tenths days, and in 10 of these cases this result was obtained in from one to seven days. Improvement in vision was definitely more rapid in the patients who received daily intravenous injections of nitroscleran (the average time was eight and two-tenths days per eye) than in those who received injections every second or third day (the average time was thirty-four and five-tenths days per eye). Improvement was definitely more rapid in the tobacco-alcohol group than in the tobacco group. Of 10 patients with tobacco amblyopia with temporal optic atrophy, 2 showed marked improvement; 7 showed slight improvement, and in 1 the condition was unimproved. Seven of the total 34 patients smoked during part or all of their treatment. Definite improvement occurred in all these while they were smoking, and 8 of the 13 eyes involved attained their best final vision in from eight to twenty days. He concludes that the use of from six to ten daily intravenous injections of 100 mgrm. of sodium nitrite (as nitroscleran) brings about rapid restoration of vision in cases of tobacco amblyopia uncomplicated by optic atrophy. In cases in which temporal optic atrophy is present the prognosis is poorer, but some improvement may be expected. In uncomplicated cases, even if the use of tobacco is continued, definite improvement in vision may be expected.

While histopathological evidence is lacking to confirm the hypothesis that the development of tobacco amblyopia is due primarily to a vascular spasm in the visual pathway, yet, because of the uniformly good results obtained with treatment based on this hypothesis, such cases deserve a trial with vasodilators. The treatment seems to be safe as well as effective.

REFERENCES.—<sup>1</sup>*Klin. Monats. f. Augenheilk.* 1930, lxxxv, 787; <sup>2</sup>*Arch. of Ophthalmol.* 1932, viii, 304; <sup>3</sup>*Ibid.* 1935, xiii, 435; <sup>4</sup>*Ibid.* 1935, xiii, 1059.

## TONSILS, AFFECTIONS OF.

F. W. Wathkyn-Thomas, F.R.C.S.

**Indications for Tonsillectomy.**—G. Dohlman<sup>1</sup> reviews the indications for tonsillectomy from the point of view of oto-laryngology and of internal medicine. He points out that as the modern views of the importance of focal sepsis have increased the demand for tonsillectomy, so some confusion has arisen as to the exact indications for performing the operation. One difficulty is that, while the physician has the opportunity of seeing the patient during his illness, the surgeon only sees him in the quiescent stage, and has to depend on the history which is given him. Although we are justified theoretically and practically in removing tonsils for repeated attacks of tonsillitis, or for complications, articular, cardiac, or renal, associated with such attacks, we cannot from the histological examination of the tonsils determine the actual pathological condition which can be regarded as responsible for the effects. As there seems to be no certain means of distinguishing microscopically the tonsil of a healthy subject from the tonsil of a patient liable to attacks of tonsillitis or of complications at a distance following such attacks, it follows that the ordinary microscopic signs cannot be of much value. If the microscope cannot decide, we cannot rely on accumulations of detritus, redness of the pillars, or evidence of lymphatic irritation; these may be evidence only of

past inflammation. If, however, the history shows a definite connection between attacks of tonsillitis and other conditions, we should remove the tonsils even if we do not find in them evidence of inflammation. Normally there is probably a continual struggle in the tonsil between invading organisms and the natural defences; thus some degree of chronic tonsillitis is a normal state, and is always present except in animals living in an environment free from outside infection. To suggest that all tonsils are therefore diseased organs and should be removed is an untenable argument, for this continual struggle is a property of lymphoid tissue throughout the body. A more legitimate conclusion would be that in the clinically diseased tonsil we have a pathological reaction which manifests itself in repeated acute attacks in the tonsil itself and by an abnormal permeability to organisms and their toxins which can result in the whole series of complications. If the tonsil reaction to bacteria in the mouth and the tonsillar tissue depends on local damage to the tonsil by previous attacks of acute tonsillitis, tonsillectomy will give a good result. If the condition is due to a general lack of resistance, tonsillectomy will not cure the pharyngitis, bronchitis, etc.

Bacteria behave according to the nutrient medium in which they live, and this suggests the importance of studying the buccal secretions and the reactionary qualities of the tonsil. In some experiments which Dohlman has performed he has found that Gram-positive organisms disappeared from the mouth after a carbohydrate-free diet. It is possible that in some cases operation, leaving as it does large new surfaces which take some days to heal, allows autovaccination to take place from the mouth. The rest in bed and the enforced partial starvation due to difficulty in swallowing may also play some part in the cure.

But in spite of these criticisms Dohlman holds that it is the duty of the surgeon to remove a tonsil which after careful examination he believes to be a source of infection which produces or aggravates pathological lesions either locally or generally, even though strict scientific proof may be lacking. At the same time, this doctrine does not exempt the physician from his responsibility; the fact that the surgeon must depend for his decision largely on the history provided him makes it the more incumbent on the physician to select with the utmost care the cases which he submits for surgical intervention.

[It is interesting to compare this paper with the debate on tonsillectomy reported in the *MEDICAL ANNUAL* last year (p. 445). Dohlman raises several points of interest which, it may be hoped, will be dealt with more fully later, e.g., the possibility of modifying the local indigenous organisms by changes in diet. On the whole, in Lord Dawson's words, the paper is "not an argument against operation, but an argument for greater discrimination in doing it".—F. W. W.-T.]

**Diathermy in Diseases of the Tonsils.**—E. R. Roberts<sup>2</sup> writes on the present status of diathermy in the treatment of tonsil disease. There has been much discussion as to the suitability of this method for ordinary cases of chronic tonsillitis (see *MEDICAL ANNUAL*, 1933, p. 494), and in this article the author describes the rise of diathermy to favour in the treatment of tonsillar sepsis and its present position in specialist opinion in the United States.

The good results obtained by diathermy in malignant disease of the tonsil suggested that it might be used for the septic tonsil. The idea was elaborated by the instrument-makers, who developed a suitable apparatus. "Ushered in by clever advertising and marketed by good salesmanship, and later by the Life Extension Institute who are advocating its use, there arose a public demand for this form of treatment utterly out of all proportion to its merits." Claims are made that the method is safe and simple; that there is less pain and less risk of hæmorrhage; finally that it saves the patient time and money.

The method has been very widely used in the States, and the writer has had a mass of material on which to base his opinions. They are uniformly unfavourable. He points out first the difficulty of removing all the tonsil. Even with bipolar needles the area coagulated is pyramidal, with the base to the faucial surface; the difficulty of complete removal is compared to taking custard out of a cup with a spoon; ridges and streaks are left between the spoonfuls. In practice the danger of secondary hæmorrhage has proved to be considerable, and when hæmorrhage does occur it is very difficult to control. In many cases there is post-operative pain. Lastly, in many cases the removal is incomplete. In support of these findings, Roberts quotes the stated opinions of various clinics, all unfavourable, and many (e.g., Shambaugh School) violently so. He summarizes his conclusions as follows:—

“Contrary to the advice freely given by some, that surgical diathermy is the procedure of choice over tonsillectomy, the facts are that with the use of surgical diathermy: Theoretically, the tonsil is not entirely removed and if my idea of the mechanics of this technique is correct, it cannot be—practically as most of us see end-results, this is the fact. The danger of secondary hæmorrhage is great. There is post-operative pain in the series of treatments. Secondary infection, with œdema, is always present in some degree, and scar tissue invariably in the end-result. Diathermy is unsurgical and dangerous in itself, and may be dangerously inefficient from the standpoint of the patient. Additional surgical removal is necessary afterwards. Tonsillectomy is, as yet, the only operation which adequately fulfils the demand for complete removal of the faucial tonsil and complete eradication of this organ as a focus of infection.”

REFERENCES.—<sup>1</sup>*Acta Otolaryngol.* 1934, xx, 394; <sup>2</sup>*Laryngoscope*, 1934, xlv, 941.

## TRACHEA, AFFECTIONS OF. (See LARYNX AND TRACHEA.)

### TRICHINOSIS.

J. D. Rolleston, M.D., F.R.C.P.

**EPIDEMIOLOGY.**—According to A. I. Goldschlager,<sup>1</sup> trichinosis is much more prevalent in the United States than is generally supposed, as is shown by the following figures: 263 cases were notified from 15 states in 1932 and 208 cases from 13 states in the first nine months of 1933, more being reported from New York and California than from any other states. A similar view as to the prevalence of trichinosis in the United States is held by W. W. Spink and D. L. Augustine,<sup>2</sup> who record their observations on 35 cases occurring in and around Boston during the last three years, and state that the majority of cases were mild. The commonest sources of infection were raw pork sausages or sandwiches and boiled ham.

**SYMPTOMS AND COMPLICATIONS.**—A. I. Goldschlager,<sup>1</sup> who reports eight cases in patients aged from 16 to 20 due to consumption of imperfectly cooked pork or sausage, states that *œdema of the eyelids and intense headache* on flexing or extending the neck were the principal symptoms. All recovered.

A fatal case of trichinosis complicated by *encephalitis and myocarditis* is reported by M. B. Gordon, R. Cares, and B. Kaufman<sup>3</sup> in a girl aged 14 following consumption of pork sausages. Symptoms of encephalitis predominated, whereas the usual diagnostic features of trichinosis, viz., gastric intestinal symptoms, muscular tenderness, and eosinophilia (until the day before death), were absent.

**DIAGNOSIS.**—Goldschlager<sup>1</sup> states that mild trichinosis may be very easily overlooked or mistaken for influenza or other infectious diseases. The intra-dermal test introduced by Bachman in 1928 was positive in all his cases in dilutions of 1-100, 1-1000, and 1-10,000. The results of precipitin tests were less positive.

W. W. Spink and D. L. Augustine<sup>2</sup> state that the most reliable diagnostic sign is the presence of eosinophilia, which usually begins in the second week, reaches its height in the third or fourth week, and then gradually declines. The skin test usually became positive about the seventeenth day of infection, and the precipitin test at the end of the fourth week. Other laboratory tests, such as search for the parasite in the stools, blood, or cerebrospinal fluid, were usually unsuccessful in their cases.

REFERENCES.—<sup>1</sup>*Ann. of Internal Med.* 1935, viii, 939; <sup>2</sup>*Jour. Amer. Med. Assoc.* 1935, liv, 1801; <sup>3</sup>*Jour. of Pediat.* 1935, vi, 667.

### TROPICAL ULCER.

*Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

Ulcers in Africans are dealt with by J. C. R. Buchanan and I. Sanderson.<sup>1</sup> They occur chiefly in underfed people and subjects of helminthic infections with a hæmoglobin percentage of below 80, and are mainly situated over bony and tendon prominences of the ankle. They were treated with Zipp dressings, either under a plaster-of-Paris casing in ambulatory cases or without it in hospital. Arsenic or bismuth injections and Hg and KI orally were used, together with a diet containing milk, meat, germinating beans, spinach, and maize-meal porridge, and patients were also given cod-liver oil, yeast, and iron. In others the ulcers were treated with a mixture of 80 parts of beeswax with 20 parts of zinc oxide spread on lint after being warmed. The dietetic treatment improved the general health without benefiting the ulcers, but the beeswax and zinc oxide accelerated healing, after preliminary cleaning up of the ulcers had been obtained by the application of Zipp in seven to ten days under the plaster-of-Paris support, and this ambulatory method of treatment was popular and economical. Zipp is composed of iodoform 2 parts, zinc oxide 1 part, paraffin liq. 2 to 3 parts to make a thick paste.

REFERENCE.—<sup>1</sup>*Trans. Roy. Soc. Trop. Med. and Hyg.*, 1935, xxviii, March, 505.

### TRYPANOSOMIASIS.

*Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

ETIOLOGY.—Important work on the natural defences against infection by trypanosomes has been done by N. and H. von Jancso.<sup>1</sup> They point out that the two known factors in producing immunity to infection by trypanosomes by drugs are: (1) The action of the drug in destroying trypanosomes in the system; and (2) The humoral immunity of the specific antibodies, which kill a considerable number of the parasites that have escaped the chemotherapeutic shock of the drugs. To these must now be added the natural defence forces of the system. These are abolished by removing the spleen in which the specific immune bodies are formed, and by the injection of electro-colloidal copper, as this poisons the reticulo-endothelial system and also abolishes phagocytosis. With the use of minimum curative doses splenectomy leads to early reappearance of trypanosomes in the blood, and if the copper preparation is also injected, the reticulo-endothelial system is poisoned and the action of germanin (Bayer 205) in causing phagocytosis of the trypanosomes is prevented, with resulting exclusion of the natural mechanisms of defence and early relapse. In a further paper<sup>2</sup> the same workers show that by the exclusion of the mechanisms of defence in the manner described above, treatment by germanin produces a drug-fast strain with remarkable rapidity, such as after 12 treatments, as against 100 passages taking some twelve months by former methods, or 250 times the normal increased resistance against the drug, apparently because the parasites rapidly adapt themselves to the drug in the absence of the defence mechanism. Ordinarily the treatment of a trypanosome infection with repeated non-sterilizing doses in normal mice led to a permanent cure, but failed completely after the exclusion of the protective forces in the manner described.

The infectivity of *Trypanosoma rhodesiense* in relapses after Bayer 205 is reported on by J. F. Corson,<sup>3</sup> who found it to be transmissible by direct inoculation and cyclically. The same worker<sup>4</sup> reports on the influence of body weight and the dose of trypanosomes in experimental white-rat infections, and he found no differences in the effect of doses of 100 to 100,000 parasites and variations of the body weight between 50 grm. and 100 grm. Corson<sup>5</sup> has also found that a strain of human *T. rhodesiense* was still infective to man after a year's transmission cyclically through *Glossina morsitans* and through dik-dik antelopes. In a further paper Corson<sup>6</sup> shows that such birds as francolins and guinea-fowls, in addition to the domestic fowl, only very rarely act temporarily as reservoirs of *T. rhodesiense*, so appear to be of little or no importance in the etiology of human trypanosomiasis. Once more the same writer<sup>7</sup> has shown that 60 per cent of *G. morsitans* fed on a reedbuck infected with *T. rhodesiense* developed an infection of the salivary glands under normal laboratory conditions.

The mechanical method of trypanosome infection has been studied by J. G. Thomson and W. A. Lamborn<sup>8</sup>—namely, through the agency of non-biting hematophagous flies. These feed readily on the serous discharges of ulcers and the secretions from the nose, eyes, and mouth, and they subsequently pass blood or serum in their numerous dejecta, which may contain large numbers of living trypanosomes, leishmania, or the *Treponema pertenue* of yaws. In Nyassaland *Musca spectanda* persistently haunts man in search of such serous fluids, and they readily ingest *T. brucei* from the blood of rats and dogs and pass the parasites in their droplet dejecta for from five minutes to six hours afterwards. Rats were infected by placing such dejecta on a fresh cut on the ear or on a drop of blood exuding from the bite of a horse-fly. Some flies also extrude infected drops of ingested blood from their proboscis five to ten minutes after a full meal.

The presence of a mild infection of cattle by *T. vivax* has been discovered in Mauritius by A. R. D. Adams<sup>9</sup> in addition to the previously known virulent *T. evansi* infection of animals or surra.

F. P. Mackie<sup>10</sup> reports on the Jarisch-Herxheimer reaction in trypanosomiasis. This consists in a cutaneous and general flare-up following treatment by organic arsenical or other drugs, including tryparsamide, and in the case now reported severe and fatal nervous symptoms following a 2-gr. dose of tryparsamide were found at an autopsy to be due to widespread hæmorrhages in the caudate and lenticular nuclei of the brain, accompanied by the presence of the morular cells of Mott.

H. L. Duke<sup>11</sup> reports that the blood of the baboon, *Papio tessellatus*, and also that of the monitor lizard, *Varanus*, when ingested by *G. palpalis* shows masses of light-green-coloured crystals in the intestinal contents of the fly; so tests were made to ascertain if the blood of these animals had any inimical effect on the development of polymorphic trypanosomes in the tsetse fly, but no definite results were obtained, as full development of the flagellates took place, although the animals are practically completely resistant to infection with the trypanosomes.

TREATMENT.—Further studies in chemotherapy are reported by W. Yorke, F. Murgatroyd, and Helen Russell.<sup>12, 13, 14</sup> The length of time an arsenical preparation remains in the circulating blood has been investigated by the trypanocidal titre of the serum of the blood at intervals after the intravenous injection of arsenobenzol, trivalent, and pentavalent arsenical compounds respectively. It was found that the first two preparations produced an enormously high trypanocidal titre in proportion to the dose, and this fell rapidly at first and more slowly later to reach zero, most rapidly in the case of

the trivalent compound. On the other hand, the pentavalent arsenical compound produced only a slight immediate trypanocidal titre, not reaching its maximum until after six hours. The authors conclude that the pentavalent compounds, such as tryparsamide, owe their therapeutic activity to a gradual reduction in the blood to the much more active corresponding trivalent compound. In discussing the application of their researches to treatment they point out that even the rapid elimination of trivalent compounds through the kidneys does not fully account for the extreme rapidity of their disappearance from the blood-stream after intravenous injection; they find that reduced tryparsamide and N.A.B. diffuse rapidly into and out of red corpuscles, as does tryparsamide, and is to some extent reduced by the hæmoglobin into the active trivalent form, and this accounts for the steadily rising trypanocidal titre of the serum during six to eight hours after the injection of the pentavalent tryparsamide.

J. M. Wallace<sup>15</sup> has tested the resistance of a strain of trypanosome in vivo to arsenic by injecting increasingly tolerated large doses of the drug up to twenty-four hours before giving the injecting trypanosome.

J. F. Corson<sup>16</sup> found that doses of from 0.015 to 0.03 grm. of Bayer 205 per kilo body weight failed to protect white rats against the bites of infected tsetse flies.

REFERENCES.—<sup>1</sup>*Ann. Trop. Med. and Parasitol.*, 1934, xxviii, Oct., 419; <sup>2</sup>*Ibid.* 1935, xxix, April, 95; <sup>3</sup>*Ibid.* 1934, xxviii, July, 225; <sup>4</sup>*Ibid.* 1934, Dec., 525; <sup>5</sup>*Jour. Trop. Med. and Hyg.* 1935, xxxviii, Jan. 1, 9; <sup>6</sup>*Ibid.* Feb. 15, 48; <sup>7</sup>*Trans. Roy. Soc. Trop. Med. and Hyg.* 1935, xxviii, March, 501; <sup>8</sup>*Brit. Med. Jour.* 1934, ii, Sept. 15, 506; <sup>9</sup>*Ann. Trop. Med. and Parasitol.* 1935, xxix, April, 1; <sup>10</sup>*Trans. Roy. Soc. Trop. Med. and Hyg.* 1935, xxviii, Jan., 377; <sup>11</sup>*Ibid.* xxix, July, 207; <sup>12</sup>*Ann. Trop. Med. and Hyg.* 1934, xxviii, July, 227; <sup>13</sup>*Lancet*, 1935, i, Jan. 26, 1916; <sup>14</sup>*Trans. Roy. Soc. Trop. Med. and Hyg.* 1935, xxviii, March, 435; <sup>15</sup>*Ibid.* 1934, Nov. 347; <sup>16</sup>*Ann. Trop. Med. and Parasitol.* 1934, xxviii, Dec., 535.

### TUBERCULOSIS, GENITO-URINARY. (See BLADDER; KIDNEY; TESTIS.)

### TUBERCULOSIS OF LYMPHATIC GLANDS.

John Fraser, Ch.M., F.R.C.S.Ed.

A fresh interest has been infused into the problem of treating this condition if we are to accept the arguments of certain French observers—P. Moure, Baude, and Ch. Rouault.<sup>1</sup> They recommend the injection into the tuberculous gland of a solution composed of *ether*, *chlorophyll*, and *formalin*—the exact proportions of the constituents and the method of preparation are not divulged. The quantity injected varies from 2 to 10 c.c., the injections are given twice weekly, and the number of them depends upon the clinical result obtained; in certain instances cure followed two injections. The technique is briefly as follows. Picking up the affected gland between the finger and thumb, the operator perforates it with a fine needle attached to a syringe holding the appropriate quantity of the fluid. The injection is then introduced into the centre of the gland, and if it is properly placed the gland becomes thin and distended as the fluid accumulates within the confines of the capsule. The authors claim that from the intra-glandular area the injection penetrates the efferent and afferent lymphatics. As the property of the solution is to induce tissue-sclerosing effects, a successful injection should result in the cure of the glandular disease and also in obliteration of the related lymphatics; the latter effect is, in the authors' opinion, an important and valuable sequel as it prevents extension of the disease. They foresee that in the future the method may have important applications in connection with the prevention of cancer dissemination.

The results recorded by the observers are not as impressive as the general trend of the communication might seem to imply. In a total of 112 cases, 43 are reported as cured, 11 were untraced, 56 are under treatment.

The reviewer is a frank advocate of the operative treatment, and he has no hesitation in stating that the results of operation are definitely better than those just recorded. A further point which must arouse dispute was brought out in discussion by M. Cuneo. In the opinion of the authors the chlorophyll is the really active substance in the combination, but M. Cuneo suggests that it is more likely to be the formalin, and to our minds this would seem a more reasonable suggestion.

REFERENCE.—*Bull. et Mém. Soc. nat. de Chir.* 1935, lxi, May 18, 664.

#### **TUBERCULOSIS, PULMONARY.** L. S. T. Burrell, M.D., F.R.C.P.

**Tuberculin.**—It is considered by some authorities that a severe skin reaction to tuberculin indicates active disease. Stewart<sup>1</sup> tested a number of children, and found that those with definite and demonstrable intrathoracic lesions had the same degree of skin sensitiveness as those with negative or indefinite signs or symptoms. He concluded, therefore, that there is no justification for the belief that children with large and severe Mantoux reactions have more extensive pathological changes or more active disease than those who are less sensitive. This view is confirmed by the work of Badger and Myers,<sup>2</sup> who tested by the Mantoux method 207 people with measured dilutions of tuberculin to determine whether there is any relation between the reaction produced and the nature of the tuberculous disease in the lung. Two groups were taken, one consisting of 161 nurses in training and the other of 46 tuberculous women. They found no consistent relation between the degree of skin reaction and the degree of activity of the disease.

Halliday Sutherland<sup>3</sup> agrees that all the skin tests are qualitative, and give no indication whether a lesion is active or not. In his opinion, however, the subcutaneous test can differentiate between active and latent disease. A febrile reaction to any dose of old tuberculin up to 0.001 c.c. means definite activity, no reaction to 0.01 excludes active disease. Reactions to about 0.005 are indefinite. The tuberculous patient may react to the injection of tuberculin locally at the site of injection, focally with exacerbation of signs in the lesion, or generally by a rise of temperature. It is the rise of temperature only which is used in the subcutaneous test.

The danger of this test has been much exaggerated, and provided it is used with ordinary caution it is quite safe. Sutherland points out that one cannot abandon the use of a drug—morphia, for example—because it is dangerous if improperly employed. He describes six types of febrile reactions<sup>4</sup>: (1) An immediate reaction with a fall by crisis. (2) An immediate reaction with fall by lysis, the normal being reached within forty-eight or seventy-two hours. (3) A delayed reaction and fall by crisis. (4) A delayed reaction and fall by lysis. (5) A progressive reaction and fall by crisis after some seventy-two hours. Sutherland regards this as a danger signal, the rising temperature being due to focal reaction. (6) A progressive reaction which persists or falls by lysis is the temperature of tuberculous bronchopneumonia, and indicates that too large a dose of tuberculin has been given. He regards the ideal case as one with early symptoms and suspicious X-ray signs with the diagnosis confirmed by the subcutaneous test. Tuberculin is contra-indicated in febrile cases, but after a period of rest in bed or sanatorium treatment the temperature may settle and the patient become suitable for tuberculin.

In treating a case with tuberculin he advocates starting with a small dose, such as 0.1 c.c. of dilution 4 (or even a smaller one if there is a strong skin



reaction to the preliminary subcutaneous test), and doubling until a reaction occurs, when the dosage should be increased gradually by adding a half, quarter, fifth, or tenth to the next dose—the object being to increase the dose as much as possible short of causing a reaction.

The tubercle bacillus is said to consist of: (1) A protein part, which alone can make the uninfected body allergic, or produce a reaction in the allergic body; (2) A lipin part, which causes cell necrosis; and (3) A carbohydrate part.

*Purified Protein Derivative* (P.P.D.) has been isolated by Florence Seibert, and can be obtained in tablet form. It is said to contain no extraneous proteins.

Long, Seibert, and Aronson<sup>5</sup> state that the various preparations of old tuberculin are of unknown strength of the active principle. The suggested dose of P.P.D. for testing by the intradermal method is 0.00002 mgrm., and failing a reaction 0.005 mgrm. is then given. It is claimed that the smaller dose causes a reaction in the highly sensitive cases, and if not the larger one can be given without fear of a severe reaction, and will detect the remainder of positive cases. They admit that, as with other tuberculins, P.P.D. may fail to cause a reaction in an occasional case of old healed tuberculosis with calcified foci. Reactions to P.P.D. should be examined forty-eight hours after the injection. If negative, there is no swelling, or only a very little, and no redness. Positive reactions may be classified as:—

- + Swelling of from 5–10 mm. in diameter.
- ++ Swelling of from 10–20 mm.
- +++ Swelling of more than 20 mm.
- ++++ Swelling and necrosis.

*Hamburger's Test* is a modification of the Moro test. The skin over the sternum is rubbed with ether to free it of fats, and then a small drop of ointment is well rubbed in, and the result read forty-eight or more hours later. If positive, papules are seen over the area. Dorothy Price,<sup>6</sup> using this method in Dublin, found an error of only 4.5 per cent. She also found a low percentage of reactors which may be taken as indicating a racial susceptibility. Although this test may be helpful in certain cases of children it cannot be regarded as of the same value as the von Pirquet or Mantoux test.

*Triboulet Test.*—Robinson and Cruickshank<sup>7</sup> tested 109 patients at Papworth Settlement by this method in the hope of diagnosing early intestinal ulceration. They came to the conclusion that the test was not reliable. Of 93 cases the clinical and Triboulet results were as follows:—

TRIBOULET TEST	CLINICALLY		
	Negative	Probable	Positive
Negative .. ..	15	3	1
Positive ( 5 hours)	34	8	7
„ (24 hours)	18	7	0

**Radiology.**—Fellows<sup>8</sup> reports on 141 cases of pulmonary tuberculosis in apparently healthy applicants applying for employment at the Metropolitan Life Insurance Company, New York City. A fluoroscopic examination was made in each case, and if any suspicious shadow was seen a radiograph was taken. By these means 91 (65 per cent) were diagnosed in the minimal stage, 42 (30 per cent) in the moderately advanced, and 8 (5 per cent) in the advanced stages. This proportion of minimal cases is about five times greater than the

average admission rate of minimal cases: 131 went on to the sanatorium, and of these 23 had a positive sputum, 12 were positive with a guinea-pig test, and a further 4 were subsequently positive; 90 had negative laboratory reports throughout.

Physical signs are notoriously misleading in the diagnosis of tuberculosis of the lung, and it is possible for advanced disease to exist without any physical signs being detected even after careful examination by experienced physicians. The only sign which is of real importance, and is almost pathognomonic of tuberculosis, is the presence of crepitations heard over the upper part of the lung, and persisting after cough. It is noteworthy that this sign was present in 59 (42 per cent) of this series. Owing to the expense of routine radiography a film is taken only if there is some indication in the history or physical or screen examination. In 59 out of the 141 cases it was only as a result of fluoroscopic examination that evidence of disease was detected.

Kattend<sup>9</sup> stresses the importance of fluoroscopy, which is regarded as an essential part of examination at Munich. Clinical examination alone missed disease in a large proportion of cases, and fluoroscopy, though much less expensive than taking a film, will detect the disease in nearly every case.

Taylor<sup>10</sup> states that radiographs show that the lesions in pulmonary tuberculosis are either exudative or productive. The former ends either by complete resolution, by the formation of a fibrous scar, or by caseation and ultimate excavation. The productive form leads to fibrotic strands with nodular fibrosis and numerous small cavities like a bronchiectasis. Taylor states that these types are not serial changes of one lesion. Clinically as well as radiologically, each type runs its own characteristic course. As regards the indication for treatment, they fall into two groups which he calls benign and malignant. In the former, there is practically no mortality, but the latter leads to breaking down of lung tissue with local and metastatic spread of disease.

**Pregnancy and Tuberculosis.**—Floyd<sup>11</sup> points out that pregnancy throws a considerable strain upon the woman. It makes demands on calcium, iron, and iodine metabolism; the parathyroids hypertrophy and cause an additional drain of calcium. During the later months of pregnancy the basal metabolism is raised some 30 per cent. There is glycogen deficiency in the liver and a lowered renal threshold for sugar. In addition to this the rate of respiration is increased, and the number of red blood-corpuscles diminished. Parturition adds a further strain, and Floyd states that the descent of the diaphragm causes a sudden fall of intrapleural pressure. He says that sanatorium treatment to be of real value should include the whole period of gestation and a period of at least six months after parturition.

*Artificial pneumothorax* will render the pregnancy safer, but should be given carefully towards the later weeks, when both lungs are embarrassed by the raised diaphragm. He advocates the immediate induction of artificial pneumothorax in cases of unilateral disease when pregnancy occurs. If for any reason pneumothorax cannot be induced he advocates *abortion*, but points out that in advanced cases abortion cannot save the mother, and sacrifices the child. In the early stages of pregnancy termination is a simple matter and need not distress the patient, but after the fourth month it is a serious operation. One would certainly expect the intrathoracic pressure to be raised during the later stages of pregnancy, but this is not found in all cases treated by pneumothorax. Ford<sup>12</sup> describes a case where the confinement took place on April 14. On April 9 the intrapleural pressure was  $-12 - 5$ , and this was raised to  $-2 + 2$  by giving a refill of 500 c.c. On April 20 the pressure was  $-7 - 4$ , which was raised to  $0 + 4$  by giving 340 c.c. of air.

Lloyd and Richard<sup>13</sup> recorded the intrapleural pressures in four patients before, during, and after labour. As would be expected, there was a great rise during the pains, but after delivery there was no noticeable fall. The patients were under gas and oxygen anaesthesia during delivery: otherwise the intrapleural pressure would probably have been still higher. The pressure in cm. water in one of their cases varied as follows:—

ANÆSTHESIA	INSPIRATION	EXPIRATION	REMARKS
None .. ..	—14	— 5	Before labour
Gas and oxygen—			
Deep .. ..	—16	+ 7	Head presenting
Deep .. ..		+ 85	Birth of head
Deep .. ..	+ 52	+ 57	Expulsion of placenta
None .. ..	+ 4	+ 11	
None .. ..	— 9	+ 2	After refill of 250 c.c.

They state that during artificial pneumothorax treatment they have found pressures of from + 50 to + 65 in women and from + 109 to + 249 for men by getting them to make violent expiratory efforts.

**Pulmonary Tuberculosis in Young Women.**—Bentley<sup>14</sup> suggests that no single factor accounts for the fact that pulmonary tuberculosis has failed to decrease amongst young women as it has with others during the last half century. It has been suggested that this is due to a large proportion of people reaching adult life without the protection of a previous infection. If this were a serious factor one would expect it to affect both sexes alike. It has also been suggested that women stay at home, and their domestic duties render them more liable to acute infection. This may play some part, but the incidence of tuberculosis as regards age and sex varies so greatly that one must suspect some more definite explanation.

Webb, Gilbert, and Ryder<sup>15</sup> consider that endocrines play an important part in making the disease so frequent and acutely active in young women. It is at least remarkable that the incidence rises abruptly at the age of puberty, and falls quickly after the age of about 35 or 40 in women, whereas in men the rise starts later but lasts longer. This peculiarity is found in all countries however varied are the habits of the people. For England and Wales during 1933 the deaths from pulmonary tuberculosis were:—

AGE	MALES	FEMALES
10-15	135	280
15-20	795	1379
20-25	1787	2110
45-50	1701	690

From 1901 to 1929 the decline of pulmonary tuberculosis in England and Wales was:—

AGE	MALES	FEMALES
10-15	42%	42%
15-20	21%	0
20-25	36%	4%

Lyle Cummins<sup>16</sup> thinks that physiological factors are important, but he stresses the risks of domestic occupations at a susceptible age, and the exposure to infection in homes of open cases for those who sweep out the rooms, make the beds, and attend to the sick.

**Childhood Tuberculosis.**—Saye, Shelton, and Alsina<sup>17</sup> inoculated guinea-pigs with the gastric contents of 107 tuberculous children, and tubercle bacilli

were found in 44 (41 per cent) ; of these 44, there was a history of contact in 26, the remaining 18 having had no known exposure to infection. Almost all the children showed some impairment of health and responded strongly to tuberculin, but pyrexia was rare.

Parsons<sup>18</sup> disagrees with the popular belief that pulmonary tuberculosis in early childhood is nearly always fatal. He cites epituberculosis as a benign form commonly found in children. It is associated with slight malaise, and radiography may disclose an extensive area of consolidation of the lung, but recovery is the rule, although the condition may last for months. He believes that the course of the disease in childhood depends upon the dose ; a small one may be completely overcome ; a moderate one produces infiltration which may go on to perifocal inflammation ; a massive dose may lead to a generalized tuberculosis or to caseous pneumonia and cavitation.

He remarks that in the majority of cases of tuberculous meningitis the infection comes from one of the parents, only rarely does it come from milk.

**Blood Picture in Pulmonary Tuberculosis.**—Houghton<sup>19</sup> has elaborated his work on the blood, and discusses the results of testing over 1000 cases. He uses the sedimentation rate (S), von Bonsdorff's<sup>20</sup> (VB) variation of the Arneth count, and the differential leucocyte count. Neutrophils (P), monocytes (M), lymphocytes with eosinophils added (L). His formula is  $VB = [SR + (P + M - 2L)]$ , and a result of 260 or over is regarded as normal. He found that activity in the tuberculous process is reflected in the blood picture, and leads to decrease of lymphocytes and eosinophil percentages, and in the von Bonsdorff count, and increase in the sedimentation rate, but the different criteria are not always affected to the same extent. He suggests that the sedimentation rate is affected by constitutional disturbance, the von Bonsdorff count by toxæmia, and the differential count by changes taking place in the lungs. He has found the blood picture of value in prognosis and as a guide to treatment, since it will often indicate a breakdown before physical signs or symptoms of it appear. Dramatic improvements in the blood picture sometimes follow artificial pneumothorax or phrenic evulsion. There is not much change, however, as a result of routine sanatorium treatment, and only a slightly greater improvement in those treated by sanocrysin.

Muller and Davidson<sup>21</sup> state that a patient with pulmonary tuberculosis will have a normal monocyte-lymphocyte ratio at some time or other during the disease, so that it cannot be used for diagnosis, and it is not as sensitive as the sedimentation rate as an index of activity. It does, however, give valuable information as to the degree of resistance of the patient. An increasing ratio indicates the supremacy of the infection, whilst one that is normal or below indicates good resistance of the patient.

#### TREATMENT.

**Artificial Pneumothorax.**—Artificial pneumothorax is still regarded as the safest and most reliable method of collapsing a lung, but its possible dangers are becoming more appreciated. Jaquerod<sup>22</sup> says that pneumothorax should not be lightly undertaken, for it may lead to a series of painful procedures continued over a number of years. Amongst these procedures we may mention phrenic evulsion, aspiration or drainage of a tuberculous empyema, and thoracoplasty in two, three, or more stages. He points out that there are cases which reap the greatest possible benefit by being given the opportunity of obtaining a lasting cure by simple and natural means.

Dufault and Laroche<sup>23</sup> discuss the difficult problem of when the lung should be allowed to re-expand after collapse by pneumothorax. To allow this too soon is to risk a recurrence of activity, and may necessitate thoracoplasty if

the pleural surfaces adhere. To delay is to risk thickening of the pleura and the dangers associated with a permanent pneumothorax, but they emphasize their view that the dangers of maintaining a pneumothorax for many years are not great. They point out that a small infiltration without cavities will heal quickly and therefore the lung need not be collapsed for so long as one with old fibro-caseous lesions, which may require seven years of collapse before healing occurs. A minimum of two to three years' collapse from the time the sputum has become negative is suggested for the early cases without visible cavities. In those with fibro-caseous lesions with thick-walled cavities five to seven years' collapse may be needed.

Myers and Levine<sup>24</sup> advocate artificial pneumothorax at the earliest moment. They point out that the complications associated with the treatment are very rare in early cases, and that delay in collapsing the lung often leads to spread of the disease. Ebert<sup>25</sup> also advocates the early application of pneumothorax. It involves a long course of treatment, but may save months of invalidism.

Pottenger<sup>26</sup> thinks that cases of pulmonary tuberculosis fall into two types, the one that tends to heal without operative assistance and the other that does not. In the first group he puts practically all the early cases which include limited lesions whether proliferative or exudative with small cavities. In the other group he puts the more advanced cases such as larger cavities, or cavities in proximity to adherent pleura. Although cases in the first group may be expected to heal by natural methods, this does not mean that operative measures are contra-indicated, for some such special treatment may be needed in any stage of the disease.

Taylor<sup>10</sup> is of opinion that cases can be recognized by radiography as either benign, in which case there is practically no mortality and no special treatment is required, or malignant, in which case the prognosis is bad unless some collapse treatment is started. His classification, according to X-ray findings, is given in an earlier paragraph. There can be no doubt that radiography is of the utmost importance in determining whether or not artificial pneumothorax should be induced.

A mobile mediastinum may prove a very troublesome complication in artificial pneumothorax treatment, and some times makes it necessary to abandon the treatment. Thoracoplasty is dangerous in these cases, for the patients are apt to die of mediastinal flutter. Phrenic evulsion has been tried, but often makes matters worse by adding a mobile diaphragm which fluctuates with change of intrathoracic pressure. *Gomenol* has been used in these cases with success, but more recently a 50 per cent solution of *glucose* has been injected into the pleural cavity in order to produce an effusion and subsequent adhesions between the visceral and parietal pleura over the lower zones of the lung and thus anchor the mediastinum. At first 20 or 30 c.c. of the glucose solution are injected, and this quantity is gradually increased at weekly intervals up to 100 or 200 c.c.

Chandler<sup>27</sup> describes 110 consecutive operations for the division of adhesions (*internal pneumolysis*) performed on 89 patients between 1929 and 1934. Of these, 47 remain in good health, 11 in fair health, 6 are not robust or have had a relapse, 3 are ill, 15 dead, and 7 untraced. It must be noted that these cases include several bilateral and many advanced cases. Effusion formed in 24, of whom 20 are well to-day, so that this complication is not really serious although it may lead to obliteration of the pneumothorax cavity. An empyema occurred in 7 cases, in 3 of which it was tuberculous. Hæmorrhage occurred 15 times in this series, and was always from the parietal pleura or parietal end of the stump. It was controlled in every case and there never was a

hæmothorax. To prevent bleeding, care was always taken to coagulate before using the electro-cautery.

**Climate.**—Evans<sup>28</sup> believes that climate is of secondary importance in the treatment of tuberculosis, although it used to be regarded, and still is by most of the general public, as one of the essential factors. Now it is becoming more and more recognized that rest is the essence of treatment, that provided the patient has his rest and exercise regulated by a physician of experience, the actual site of the sanatorium or the climate in which he is being treated is of minor importance. He states that treatment in unfavourable climates near the large Eastern centres of population in America can and is being successfully carried out.

It is, however, a matter of the first importance to make the patient as happy as possible, or at least to try and remove all unnecessary restrictions which make life irksome for him, and so the psychological effect of climate should be considered. If a patient wants to go to a certain place and has confidence that he will improve there, it is usually wise to send him, and similarly it is a mistake to send him to a place that he dislikes. For example, a patient who is pining to go to Switzerland will very likely improve rapidly if sent there, but one who dislikes the altitudes and has no confidence that the crisp dry air is beneficial is better treated elsewhere. For certain advanced or very acute cases the altitudes are actually harmful, and it often happens that patients arriving at such places as Davos or Arosa have to be sent at once to a lower altitude. The value of the high Alps is partly due to the reduced pressure of oxygen and partly to the excess of ultra-violet light. These conditions produce a rise in serum calcium and stimulate the blood-forming tissue.

Gauvain<sup>29</sup> thinks that sun treatment is not so important as alterations of heat, cold, light, and shade. A change from a heat wave to a week or so of dull or wet weather is beneficial for tuberculous patients; he therefore regards the English climate as good.

R. A. Young<sup>30</sup> quotes Ellsworth Huntington: "the climate of England comes nearer to the ideal than almost any other place." He, too, stresses the importance of variability.

The great variation in the death-rate from tuberculosis in different countries in Europe suggests that climate can play but a small part. In 1926 it was as follows per 10,000 of the population.<sup>31</sup>

Hungary ..	241	Switzerland ..	145
France ..	209	Germany ..	97
Spain ..	151	England and Wales ..	94
Italy ..	154	Holland ..	87

And yet people will leave England and Holland and flock to Switzerland or one of the Southern countries.

REFERENCES.—<sup>1</sup>*Jour. Amer. Med. Soc.* 1934, ciii, 3, 176; <sup>2</sup>*New Eng. Jour. Med.* 1934, cxxi, 241; <sup>3</sup>*Med. Press and Circ.* 1934, clxxxix, 155; <sup>4</sup>*Brit. Jour. Tubercul.* 1935, xxix, 26; <sup>5</sup>*Tubercle*, 1935, xvi, 304; <sup>6</sup>*Irish Med. Sci.* 1934, July, 302; <sup>7</sup>*Brit. Jour. Tubercul.* 1935, xxix, 164; <sup>8</sup>*Amer. Jour. Med. Sci.* 1934, clxxxviii, 533; <sup>9</sup>*Zeits. f. Tuberk.* 1929, lv, 193; <sup>10</sup>*Jour. Amer. Med. Assoc.* 1935, civ, 898; <sup>11</sup>*New Eng. Jour. Med.* 1935, ccxii, 379; <sup>12</sup>*Tubercle*, 1927, ix, 112; <sup>13</sup>*Amer. Jour. Med. Sci.* 1935, clxxxix, 119; <sup>14</sup>*Jour. of State Med.* 1934, xlii, 249; <sup>15</sup>*Amer. Rev. Tubercul.* 1921, v, 266; <sup>16</sup>*Brit. Jour. Tubercul.* 1935, xxix, 4; <sup>17</sup>*Presse méd.* 1934, xlii, 148; <sup>18</sup>*Lancet*, 1934, i, 1101; <sup>19</sup>*Tubercle*, 1935, xvii, 49; <sup>20</sup>*Beitr. z. Klin. d. Tub.* 1913, Supp. 5; <sup>21</sup>*New Eng. Jour. Med.* 1934, cxxi, 248; <sup>22</sup>*Brit. Jour. Tubercul.*, 1935, xxix, 86; <sup>23</sup>*Amer. Rev. Tubercul.* 1935, xxxi, 1, 139; <sup>24</sup>*Ibid.*, 518; <sup>25</sup>*Deut. med. Woch.* 1922, xlviii, 1211; <sup>26</sup>*Amer. Jour. Med. Sci.* 1934, clxxxviii, 169; <sup>27</sup>*Lancet*, 1935, ii, 879; <sup>28</sup>*Jour. Med. Assoc. S. Africa*, 1934, viii, 865; <sup>29</sup>*Jour. of State Med.* 1930, xxxviii, 468; <sup>30</sup>*Med. Press and Circ.* 1934, July; <sup>31</sup>*Tubercle*, 1931, xiii, 115.

**TUBERCULOSIS, PULMONARY: SURGICAL TREATMENT.***A. Tudor Edwards, M.Ch., F.R.C.S.*

**Thoracotomy.**—Increasing reports are found in the literature of the surgical treatment of pleuro-pulmonary adhesions during pneumothorax treatment. The measure has been accepted for some time as of value within its very definite limitations. It is, like other measures, likely to incur considerable odium unless due care and consideration are observed in its indications and skill in its practice. It is very doubtful whether extensive short adhesions are ever worth the risk of their division by cautery in view of the evident dangers of damage to the lung with its subsequent secondary infection of the pleura. Such cases are the usual precursors of the disasters which are met with after this operation, and while other less dangerous measures are still available, obviously, in general, it can be considered inadvisable to cauterize such even by the method of so-called enucleation (Maurer). A good deal of discussion has taken place as to the time at which these adhesions should be divided, and it is obviously an advantage to allow sufficient time to elapse before undertaking their division, as large numbers of bands, which earlier in the treatment would appear to require cauterization, will subsequently stretch and disappear. In spite of the increase of the reports and the literature little seems to be added to improvement in technical procedure except for an increasing tendency to return to the original electric cautery rather than the high-frequency current as a means of division; particularly in this country there is a tendency to reserve the diathermy current as a means of dealing with any residual bleeding from the stumps, especially that on the chest wall after division. Realization of the difficulty in controlling the spread of the coagulation towards the lung has been the cause of this return to the earlier type of cauterization.

**Phrenicectomy.**—Considerable doubt has been thrown recently upon the value of phrenicectomy in pulmonary tuberculosis. This is the inevitable result of the indiscriminate use of this operation where the true indications are ignored and it has been employed in a haphazard manner. In judging the value of this relatively minor operative procedure it is essential to realize its limitations, and to estimate the results according to what is expected of it in the particular case involved. In a large proportion of cases it is not intended as a sole curative procedure but as an aid to other measures, such as pneumothorax; in some cases to relieve pain; in others to limit the rapidity of reaccumulation of effusions and such-like complications. If its value is estimated upon this basis, no one of experience can doubt its value. Its use alone in widespread unilateral fibrosis or fibro-cavernous disease can only result in its condemnation.

The value of phrenicectomy in the soft-walled apical cavities is often difficult to forecast, and it is in such cases where phrenicectomy has failed that localized thoracoplastic measures are often required later. The performance of an upper thoracoplasty in cases with a paralysed diaphragm has been definitely shown to increase the incidence of basal atelectasis—so-called inhalation pneumonia. As it is, therefore, inadvisable to have a permanently paralysed diaphragm when the outcome of the operation is problematical for apical cavitation, there has been a considerable increase in the numbers of temporary phrenic operations performed. As a rule, after crushing of the main phrenic nerve, and the division of accessory branches, paralysis of the diaphragm persists for about four to six months.

Should the apical lesions heal during this period the phrenic paralysis may be made permanent. If, however, the effect upon the lesion is disappointing, localized apical thoracoplasty may be considered afresh on its merits.

O. Monod<sup>1</sup> advises in all cases in which a permanent phrenicectomy is

desirable that the nerve to the subclavius should also be divided, as unless this is done there is often recovery of function of the diaphragm owing to the communicating branches between the phrenic nerve and the subclavius nerve below the clavicle taking over the function of the paralysed phrenic nerve.

**Extrapleural Thoracoplasty.**—Hedblom and Van Hazel<sup>2</sup> record results of total posterior extrapleural thoracoplasties and partial thoracoplasties in 3762 cases reported in the literature since 1926, including 200 cases of their own. The partial thoracoplasties number 236. Of these results special reference is made to early and late mortality, causes of death, and duration and degree of improvement or of rehabilitation. The authors' mortality was 10.3 per cent; of the remainder, the mortality was 10.5 per cent. From one-quarter to nearly one-half of the deaths, occurring within a period of from five to ten years, took place in the first eight weeks. The most common causes were cardiac failure and pulmonary complications, of which the latter comprised 34 per cent of the total mortality. Among the total number of patients—namely 3762—from one to twelve years after operation 35.3 per cent were free from symptoms and at work, 22.1 per cent were improved and able to do some work, 5.5 per cent were not improved or were made worse by the operation, 3.5 per cent were untraced, and 33.6 per cent were dead at the time of the report.

As the result of the accumulation of these records the authors have come to the following conclusions:—

“The surgical treatment of pulmonary tuberculosis offers to properly selected patients not suitable for pneumothorax therapy the best if not the only prospect of a complete arrest of the disease, and when that cannot be achieved, of relief of symptoms and prolongation of life.

“The proper selection of the patients and of methods, and of the most opportune time for operation, demands the closest collaboration of the physio-therapist and surgeon.

“From one-quarter to one-half of the total deaths during the first ten years following thoracoplasty occur during the first eight weeks, and are due largely to shock, cardiac failure, and pulmonary complications, all in considerable measure preventable through pre-operative preparation, through operation graded into stages according to the patient's condition, and watchful prolonged post-operative supervision. Such measures will extend indications for operation. Even though by so doing the total mortality is not reduced more, patients otherwise hopeless are given the chances it affords.

“Deaths after the first eight weeks are due largely to extension of the tuberculosis, in some measure preventable through primary adequate collapse, through secondary additional collapse or compression for recurrence, and through reasonable care of health.

“Adequate application of the method or combination of methods indicated, early in the disease before extensive destructive changes in the lung, and before secondary visceral damage has occurred, will result in a minimal mortality, a maximal conservation of respiratory function, and in the greatest possible measure of rehabilitation.”

Overholt<sup>3</sup> discusses selective thoracoplasty, and states that the attitude towards these procedures is changing, particularly as regards the extent of the operation and the preservation of relatively normal lung tissue. In addition, he advocates a wider interval between stages than is commonly accepted. Out of a total of 73 patients, 60 have had only a partial thoracoplasty, generally carried out in stages. Of these, 35 have had their collapse treatment completed, which has resulted in closure of the cavities, as shown by X rays, in 34 patients, and 30 have negative sputum.



Semb<sup>4</sup> reports the use of a new type of what is termed 'extra-fascial pneumolysis' in association with thoracoplasty. By this he is able to realize a complete freeing of the apex of the lung and collapse of the cavities in that region from above downwards as well as from side to side. In the majority of cases this procedure has been confined to the apical or upper lobe regions, and less commonly to the extensive unilateral types of disease. In association with this there is complete resection of the whole of the first and second ribs and decreasing lengths of the subjacent ribs. Posteriorly, the medial stumps of the ribs are resected beyond the point of the transverse process after exarticulation at the costo-vertebral joint. Likewise the uppermost intercostal muscles and the periosteum of the ribs are divided posteriorly. The operation is performed in one or several stages. In the cases operated upon complete collapse of the cavity or cavities was obtained in more than 90 per cent, and freedom from bacilli in more than 80 per cent, with mortality of just under 3 per cent.

An account of the treatment of tuberculosis by this method is also given by Holst, Semb, and Frimann-Dahl.<sup>5</sup> The whole procedure has been carried out under local anaesthesia, and operation has been done on 200 patients in three different sanatoria. Considerable care is taken in the localization of the cavities, particularly from an antero-posterior aspect. Isolated cavities were found in one of the upper lobes in 128 cases; in the middle and lower lobes in only 8. This goes to prove that in the great majority of cases of surgical pulmonary tuberculosis, collapse of the upper lobe alone is required. In their opinion the paravertebral total thoracoplasty does not have a selective effect, and it does not produce definite effective collapse of the upper lobe. The cause of this deficient collapse is partly deficient relaxation from one side to the other, i.e., insufficient resection over the upper lobes; partly that the lung does not relax from above and from behind. This has been the cause of the evolution of Semb's procedure, which is stated to allow the cavity to shrink concentrically. The authors furthermore show that the mortality of the operative procedure depends upon the extent of the operation and its impairment of the expectorative ability with its accompanying pulmonary complications. The most frequent post-operative pulmonary complications depend upon the retention of bronchial secretion due to the reduced expectorative ability of the operated side. Of a total number of 14 deaths, all were due to these complications. Approximately 50 per cent of the cases examined radiologically revealed post-operative atelectasis. It is important, therefore, to avoid too extensive resection of ribs in one stage, to avoid phrenicectomy as a preliminary operation to thoracoplasty, and to take particular care when operating upon patients with a mobile mediastinum. Furthermore, the authors attach importance to the choosing of the right time and the favourable phase of the disease for the operation.

REFERENCES.—<sup>1</sup>*Presse méd.* 1935, xliii, Feb. 23, 299; <sup>2</sup>*Jour. of Thor. Surg.* 1934, Oct., 55; <sup>3</sup>*Ann. of Surg.*, 1935, Jan., 576; <sup>4</sup>*Acta Chir. Scand.* 1935, lxxvi, suppl. 37; <sup>5</sup>*Ibid.*

## TULARÆMIA.

J. D. Rolleston, M.D., F.R.C.P.

EPIDEMIOLOGY.—G. Olin<sup>1</sup> states that in a previous paper he had shown that in 1931 about 30 cases of tularæmia had been observed in Sweden among human beings and 2 in hares (see MEDICAL ANNUAL, 1934, p. 499). Since then no further human cases had been discovered in Sweden, although the disease was still present in hares, guinea-pigs, and squirrels.

SYMPTOMS AND COMPLICATIONS.—C. N. Kavanagh<sup>2</sup> records his observations on 123 cases, 69 of which appeared in males and 54 in females; 108 were of the primary cutaneous type, 6 of the primary ophthalmic type, and 9 of a cryptogenetic type. The average incubation period in 58 cases was four and a half days. Pulmonary involvement occurred in 16, the head was affected

in 2, abdominal symptoms were prominent in 5, peritonitis being present in 2. Delirium was a striking feature in 6 and acute mania occurred in 1, subcutaneous nodules were found in 20, and a cutaneous eruption in 23. There were 5 deaths. The characteristic pathological process consisted in the presence of focal areas of necrosis in various stages of evolution.

The frequency of *pulmonary involvement* in tularæmia, to which reference was made in previous issues (see MEDICAL ANNUAL, 1933, p. 513; 1934, p. 499; 1935, p. 458) is emphasized by S. D. Blackford,<sup>3</sup> who found clinical evidence of pleuro-pulmonary involvement in 17 out of 35 cases. Pneumonia was shown by clinical and X-ray examination to be present in 7, bronchitis alone in 7, and pleural fluid was aspirated in 3.

REFERENCES.—<sup>1</sup>*Bull. Off. internat. d'Hyg. publ.* 1934, xxvi, 890; <sup>2</sup>*Arch. of Internal Med.* 1935, lv, 61; <sup>3</sup>*Jour. Amer. Med. Assoc.* 1935, civ, 891.

#### TYPHOID FEVER. (See also PARATYPHOID FEVERS; SCARLET FEVER.)

J. D. Rolleston, M.D., F.R.C.P.

EPIDEMIOLOGY.—A. Loir and H. Legagneux<sup>1</sup> report an epidemic of typhoid fever at Havre, where 3 cases occurred in July, 4 in August, and 17 in September, 1934, with 3 deaths. There was a history of consumption of raw mussels or other shellfish in each case shortly before the onset of the disease. The writers attribute the outbreak to the injurious effect upon the shellfish produced by the oil discharged from the numerous factories used for refining petrol into the estuary of the Seine at Havre. Although the oil is not in itself very toxic, it causes a morphological degeneration in the shellfish which reduces its natural resistance to typhoid infection. In view, therefore, of the increasing tendency to set up petrol-refining factories near estuaries, both for the sake of economy in transport and for obtaining the water needed for the working of the factories, it is most important that the shellfish in such areas should not be eaten until they have been cooked.

The twenty-third annual report of the *Journal of the American Medical Association*<sup>2</sup> on the 93 cities in the United States with a population of more than 100,000 shows that while the total number of typhoid deaths in these cities was the same in 1934 as in 1933 (see MEDICAL ANNUAL, 1935, p. 459) three cities (Fall River, Lynn, and Waterbury) completed their fourth consecutive year without a single typhoid death.

SYMPTOMS AND COMPLICATIONS.—According to J. Martel,<sup>3</sup> the frequency of *relapses* in typhoid fever depends upon several factors, of which the most important is the patient's age, the incidence being 4.5 per cent in the adult as compared with a frequency ranging from 6.5 to 30 per cent in the child. Relapses are commoner in mild or moderate attacks than in severe forms. Their pathogenesis appears to consist in auto-infection. As a rule the relapse is of shorter duration and less severe than the primary attack. The only constant sign is a rise of temperature, the next most frequent manifestations being headache, enlargement of the spleen, rose spots, and intestinal symptoms. The diagnosis is easy when the primary attack has been recognized. The prognosis is usually good.

M. A. Perez-Medina<sup>4</sup> states that the *coexistence of typhoid fever and tuberculosis* may occur under the following circumstances: (1) Typhoid fever in a tuberculous subject; (2) Tuberculosis and typhoid fever running a parallel course in the acute stage—a very rare occurrence; (3) Tuberculosis following typhoid fever. In the first group the two diseases run their course independently, and it is rare for tuberculosis in such cases to show either improvement or aggravation. In the second group the prognosis of typhoid fever is grave if the tuberculous process becomes active. In the third group the tuberculous

disease may occur during or after convalescence from typhoid in the form of a pleural or pulmonary process. The diagnosis is often difficult when the two diseases coexist. As regards prognosis, meningitis and generalized miliary tuberculosis are not uncommon in young persons following typhoid fever. In view, therefore, of the occasional association of the two diseases special care should be taken to protect typhoid patients from tuberculous infection, and vice versa.

L. Cartagenova<sup>5</sup> records three cases of the *association of typhoid fever and measles* in children aged 4, 5, and 7 years respectively. In each case the measles eruption appeared in convalescence from typhoid fever. In two who recovered nothing remarkable developed apart from the pale pink colour of the measles eruption, while in the third patient who died the rash lasted barely twenty-four hours, death being due to bronchopneumonia. In none of the cases was there the recrudescence of the intestinal symptoms observed by Dumontet.

H. Nicolas<sup>6</sup> reports eight cases in patients aged from 8 to 26 years in whom typhoid fever (7 cases) or paratyphoid fever (1 case) was complicated by *appendicitis*. Appendicectomy was performed in 7 cases with 1 death, and 1 patient died without operation in twenty-four hours from the onset.

S. de Renzi<sup>7</sup> reports a case of *suppurative hepatitis* following typhoid fever. The patient was a boy aged 14 who on the thirtieth day of disease developed severe pain in the right hypochondrium. Death took place twenty days later after the appearance of a right pleural and peritoneal effusion. The necropsy revealed suppurative pyelphlebitis, multiple hepatic abscesses, fistula of the gall-bladder, fibrino-purulent peritonitis, and bilateral sero-fibrinous pleurisy.

A. Dufour and R. Froment<sup>8</sup> record their observations on the *nervous and mental sequelæ* among over 3000 cases of typhoid fever during an epidemic at Lyons in 1928-9. Some form of nervous complication occurred in 52 (1.7 per cent), of which 36 were psychical sequelæ, 10 were neuritic sequelæ, and 6 various nervous sequelæ, especially epilepsy. The writers found that the nervous sequelæ during the Lyons epidemic came next in order of frequency to the hepatic complications, but were more important. Nervous complications in typhoid fever are, however, exceptional. A certain number are of only transient duration and disappear in a few months or years, especially in the case of neuritis.

J. A. Toomey<sup>9</sup> studied the *reflexes* in 13 cases of typhoid fever with the following results. From seven to ten days after the onset of the disease the abdominal reflexes were modified, as the reviewer among others had shown many years previously (*see MEDICAL ANNUAL*, 1907, p. 575), there being usually a complete absence of response, if not in all, at least in the infra-umbilical quadrants. Within from twenty-four to seventy-two hours later the knee-jerks became hyperactive in 11 cases and hypo-active in 2. The knee-jerk response was followed two or three days later by the appearance first of a pseudo- and then of a sustained ankle-clonus in 10 cases. Babinski's sign appeared in 3 cases. The anatomical explanation of these phenomena is as follows. The toxins of *B. typhosus* are absorbed along the grey fibres of the sympathetic nerves, so that the post-ganglionic fibres are involved with consequent modification of the abdominal reflexes. If further absorption takes place, irritation of the somatic nerves ensues with heightened response of the knee-jerk to stimulation and ankle-clonus. The effect of the toxin usually ends there. It may, however, spread to the cell of origin of the sympathetic fibres posterior to the lateral pyramidal column and irritate the cell column of the pyramidal tract, giving rise to Babinski's sign.

PROPHYLAXIS.—L. Michard<sup>10</sup> records twenty occasions on which combined inoculation against diphtheria and typhoid and paratyphoid was carried out

simultaneously in various French regiments with the result that the two diseases almost entirely disappeared from the regiments so treated. The combined vaccination consisted of three injections carried out as follows: first injection—1 c.c. of T.A.B. and  $\frac{1}{2}$  c.c. of diphtheria anatoxin; second injection twenty-one days later—1 c.c. of T.A.B. and 1 c.c. of anatoxin; third injection a fortnight later—1.5 c.c. of anatoxin only.

M. Tsurumi<sup>11</sup> reports that antityphoid inoculation by mouth was carried out on 32,130 persons in the region of Tokyo, while 45,790 in other Japanese towns served as controls, with the result that only 5 cases of typhoid occurred among the inoculated as compared with 40 among the controls.

R. Goby<sup>12</sup> reports 35 cases of *nervous complications of antityphoid inoculation* in patients aged from 17 to 45, which usually appeared in a few hours, and less frequently a few days, after inoculation. He classifies the complications as follows: (1) Symptoms due to the action of the vaccine—(a) hemiplegia, (b) epileptic attacks, (c) mental disorders, (d) meningeal reactions, (e) spinal manifestations of the type of Landry's paralysis or poliomyelitis, (f) radiculitis or neuritis. (2) Infective or toxic symptoms apparently roused into activity by inoculation of syphilitic or tuberculous subjects. Owing to their rarity the occurrence of these sequelæ is no contra-indication to antityphoid inoculation, except in patients who have some nervous lesion of an infective or toxic type.

TREATMENT.—A. Felix<sup>13</sup> reports on clinical trials of a new *antityphoid serum* in 43 patients, 32 of whom were given it intramuscularly, 10 intravenously, and 1 intrathecally, while 17 served as controls. In the treated cases there was a rapid disappearance of toxic symptoms, while in the control group the symptoms remained entirely unaffected.

REFERENCES.—<sup>1</sup>*Paris méd.* 1934, ii, 420; <sup>2</sup>*Jour. Amer. Med. Assoc.* 1935, civ, 2093; <sup>3</sup>*Thèse de Paris*, 1935, No. 318; <sup>4</sup>*Ibid.* No. 146; <sup>5</sup>*Pédiatrie*, 1934, xlii, 1221; <sup>6</sup>*Thèse de Paris*, 1934, No. 703; <sup>7</sup>*Morgagni*, 1934, lxxvi, 1363; <sup>8</sup>*Presse méd.* 1934, xlii, 1225; <sup>9</sup>*Amer. Jour. Dis. Child.* 1934, xlviii, 1296; <sup>10</sup>*Thèse de Paris*, 1934, No. 770; <sup>11</sup>*Bull. Off. internat. d'Hyg. publ.* 1934, xxvi, 1741; <sup>12</sup>*Thèse de Paris*, 1934, No. 530; <sup>13</sup>*Lancet*, 1935, i, 799.

## TYPHUS FEVER.

J. D. Rolleston, M.D., F.R.C.P.

EPIDEMIOLOGY.—According to an official report,<sup>1</sup> the distribution of typhus throughout the world for 1933–4 was as follows. Owing to economic difficulties the disease became epidemic where previously it had been endemic and sporadic, especially in Morocco, Algeria, Tunisia, Egypt, the Union of South Africa, Basutoland, and the Urundi territory in South Africa. In the United States endemic typhus still continues to spread, while in Mexico typhus is still high, the geographic distribution is about the same, and its mortality is high. In South American countries where it had been sporadic there has been a considerable increase, as in Bolivia and Peru, and most of all in Chile, where there were 15,000 cases in 1933 and probably as many in 1934. In Asia, with the exception of Chosen, in which there had been a certain increase in 1933, followed by a decline in 1934, and in the Asiatic territories of Soviet Russia, where there had been a marked recrudescence in the first half of 1934, there had not been the wholesale increase which had been observed in Africa and America. In Europe there was an almost general increase in the disease in those countries in which it had been formerly sporadic or endemic, such as the European portion of Soviet Russia, Poland, Czechoslovakia, Roumania, Bulgaria, and, most of all, Yugoslavia.

E. H. Cluver<sup>2</sup> states that the increased incidence of typhus in South Africa in 1933 was due partly to the loss of immunity acquired during the epidemic period 1919–23 and partly to aggravation of the economic condition.

In the United States, according to H. S. Cumming,<sup>3</sup> during the last two

years typhus has tended to spread in the country districts, this invasion being preceded or accompanied by an increase in the rural population of rats, from which the disease was transmitted to man by the same flea which transmitted plague.

M. H. Ghendler<sup>4</sup> states that before the Great War typhus was not endemic in Roumania in spite of the prevalence of the disease in the neighbouring countries of Serbia and Russia. After the entrance of Roumania into the war in August, 1916, however, the crowding, promiscuity, and lack of hygiene prepared the ground for the virus which was introduced by the Russian troops in January, 1917. A great epidemic broke out, first among the soldiers and then in the civilian population. There were about 100,000 deaths, including 250 out of 1500 doctors mobilized. The campaign against the disease was rendered difficult by lack of hospital accommodation, and the coexistence of relapsing fever. As the result, however, of extensive disinfection the epidemic was almost stamped out by June, 1918, but the return of prisoners and the reflux of refugees from the Ukraine where typhus was prevalent caused a fresh outbreak though on a smaller scale, and since then the disease has been endemic in Roumania. The fatality rate, however, has fallen from an average of 20 per cent during epidemic types to 10 per cent. Most of the cases at the present time occur in Bessarabia, then in that part of Moldavia adjoining Bessarabia, and lastly in Bokovina. Ghendler attributes the persistence of typhus in Roumania to the presence of clinically non-apparent forms of the disease.

**SYMPTOMS AND COMPLICATIONS.**—According to D. Kiszelnik,<sup>5</sup> *thrombo-angiitis obliterans* is not peculiar to the Jewish race, but may be met with in all countries in which typhus is endemic, such as the Balkans and Soviet Russia. Owing to the liability of typhus to attack the vessels, and the frequency of thrombo-angiitis in countries where typhus is endemic, Kiszelnik suggests that a number of cases of Buerger's disease are due to an attenuated form of typhus, and that a careful search for that disease should be made by clinical examination and the Weil-Felix reaction in such cases.

**PROPHYLAXIS.**—Gaud<sup>6</sup> describes a method of vaccination, which he regards as practical, harmless, and efficacious, carried out by Blanc and himself on 723 prisoners aged from 16 to 20; 309 were injected intramuscularly with 1 c.c. of a vaccine of murine typhus in a dilution of 1-1000, and 414 with 2 c.c. of the same vaccine in a dilution of 1-500. A febrile reaction of four to nine days' duration ensued in 1.6 per cent of the first group and in 4 per cent of the second. Revaccination of 75 prisoners with 1 c.c. of a 1-1000 dilution three weeks after the first inoculation was followed by no reaction, indicating that they had been immunized. The duration of the immunity conferred by this vaccine has yet to be determined.

C. Nicolle<sup>7</sup> states that the protective power of Wright's vaccine, which is obtained from the intestine of infected lice, is certain though not of long duration, but that the vaccine is probably not constant, and is available only in small quantities at a time. He still regards the use of convalescent serum as the most certain and rapid prophylactic method against typhus.

**REFERENCES.**—<sup>1</sup>*Epid. Rep. Health Sect. League of Nat.* 1934, xiii, 237; <sup>2</sup>*Bull. Off. internat. d'Hyg. publ.* 1934, xxvi, 1531; <sup>3</sup>*Ibid.* 1547; <sup>4</sup>*Thèse de Paris*, 1935, No. 101; <sup>5</sup>*Ibid.* 1934, No. 513; <sup>6</sup>*Bull. Off. internat. d'Hyg. publ.* 1935, xxvii, 474; <sup>7</sup>*Rev. d'Immunol.* 1935, i, 9.

## TYPHUS FEVER, TROPICAL.

*Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.*

Further cases of tropical typhus have been described in India by A. Sachs,<sup>1</sup> who reports seven cases occurring as far apart as Jubbulpore in the Central Provinces, Bareilly in the United Provinces, and Peshawar on the North-west

Frontier. In two there was a clear history of previous tick bites, one proved fatal on the eleventh day, and in the others the fever lasted for from twelve to twenty-two days. The appearance of a widely distributed dark-red maculopapular rash on the fourth or fifth day is the most characteristic sign, and catarrh, passing gradually into bronchopneumonia, is very suggestive of the disease, together with a mousy odour, a relatively slow pulse, and the absence of leucocytosis. In two cases low titre and in two more high titre agglutination was obtained with *Proteus* X 19 'H' strains. From South Africa A. Pijper<sup>2</sup> describes a case of tick-bite typhus.

In a discussion on typhus in the tropics, J. W. D. Megaw and W. Fletcher<sup>3</sup> once more record their experience in India and Malaya respectively, and A. Felix dealt with the serology of this group of fevers. The latter agreed with J. Heatley-Spencer that they cannot be classified by their vector in the present state of our knowledge, but rather by their serology. Thus the classical epidemic typhus, tabardillo fever, endemic typhus, and groups of cases in the U.S.A., such as Brill's typhus, in Australia, Greece, Syria, Manchuria, Malaya, and Toulon, all agglutinate strongly with *Proteus* X 19 and slightly with X 2. Japanese river fever, or tsutsugamushi fever of Japan, Malaya and scrub typhus of Malaya and the East Indies, only agglutinate with XK, and undetermined types, such as Rocky Mountain spotted fever and cases met with in São Paulo and South Africa, and Indian tick typhus, give only slight agglutination with all three *proteus* types.

REFERENCES.—<sup>1</sup>*Jour. R.A.M.C.* 1935, lxiv, Oct. 217; <sup>2</sup>*S. African Med. Jour.* 1934, viii, Aug. 11, 163; <sup>3</sup>*Trans. Roy. Soc. Trop. Med. and Hyg.* 1935, xxix, July, 105.

**UMBILICAL HERNIA.** (See HERNIA, UMBILICAL.)

### UNDULANT FEVER.

*Sir Weldon Dalrymple-Champneys, Bt., M.D., F.R.C.P.*

Large numbers of cases of undulant fever continue to be reported from various foreign countries, and no continent and very few countries appear to be exempt from the disease. The reviewer has collected a series of 290 well-authenticated English and Welsh cases of endemic origin (laboratory infections excluded), but he has reason to believe that this represents only a small fraction of the cases which have occurred in this country.

Much valuable work on *Brucella* infections in man and animals has been carried out during the past year, but many difficult problems concerning the method of spread of the bovine disease, its eradication, the transmission of infection to man, and the diagnosis and treatment of the human and animal disease still await solution.

**Prevalence of *Brucella abortus* in Cattle and their Milk.**—F. W. Priestley,<sup>1</sup> carrying out agglutination tests on the blood taken at slaughter of 1210 cattle at the Metropolitan Cattle Market, Islington, found that of 844 unselected animals 27.5 per cent gave a positive reaction for *Br. abortus* and 9.1 per cent were doubtful. Of 366 selected animals, out of 100 cows 14 per cent were positive and 7 per cent doubtful; of 53 heifers 3.8 per cent were positive and 3.8 per cent doubtful; and of 213 steers 0.9 per cent were positive and 2.4 per cent doubtful.

As regards *Br. abortus* in milk, M. M. Barratt<sup>2</sup> examined 157 samples of milk by guinea-pig inoculation and isolated *Br. abortus* in 34 instances. One of the positive milks was a 'certified milk', but all the 5 samples of pasteurized milk were negative.

A. H. Priestley,<sup>3</sup> at Burnley, carried out agglutination tests on the blood of 760 guinea-pigs inoculated with milk samples in the routine examination of milk for tubercle bacilli during the years 1927-31. He found that 170

(22.3 per cent) of these guinea-pigs gave agglutination for *Br. abortus* to a titre of 1-40, and 145 (19 per cent) to a titre of 1-80. In many cases these results were confirmed by culture from the spleen, lymph glands, and heart's blood.

E. J. Pullinger<sup>4</sup> examined 101 samples of milk from tuberculin-tested herds by guinea-pig inoculation and recovered *Br. abortus* in 70 cases. He then examined samples of milk from 63 rail tanks (3000 gallons capacity) and found *Br. abortus* in 53. Of 105 samples of milk from ordinary herds (*not* tuberculin-tested) in Cheshire, 39 yielded *Br. abortus*, and of 104 samples from similar herds in Somerset, 20 gave this organism.

**Part played by Milk in Transmission to Man.**—The preponderant part played by milk in the spread of undulant fever in England and Wales was shown in a recent communication by the reviewer to the Office International d'Hygiène Publique.<sup>5</sup> Thus out of 149 cases for which the necessary information was available, raw (i.e., not pasteurized or boiled) milk or cream had been consumed in 144 cases, and in 47 of these cases there was evidence of infection in the cow—i.e., either a history of contagious abortion in the herd or the organism had been isolated from the blood and/or the milk of the cows. If the 7 cases in which the patients *may* have had direct contact with infected animals were excluded, there remained 40 patients who had consumed milk or cream which was probably or certainly infected and who had had no contact with infected animals.

The *Br. abortus* is killed by efficient pasteurization, more easily in fact than *M. tuberculosis*, and it is interesting in this connection to note that of the 290 English and Welsh cases collected by the present writer only 17 were in the London area, where over 90 per cent of the milk is pasteurized before distribution. Of 11 of these cases for which the necessary information as to the milk-supply is available, 10 were raw-milk drinkers.

**Infection by Direct Contact.**—With regard to the part played by direct contact with infected animals, their carcasses, or excreta in the transmission of the disease, in the series of 290 English and Welsh cases already referred to, 27 of the patients were farmers or farm labourers, 2 lived on farms, 3 were butchers or slaughtermen, and 2 were veterinary surgeons. It should be noted, however, that some of these patients drank raw milk which may have been infected.

**True Incidence in England and Wales.**—The cases of occupational infection in this series constitute a much smaller proportion of the total cases than is true for some other countries (e.g., Denmark and the U.S.A.), and this raises the interesting question of why with such widespread exposure to infection, both by the consumption of cow's milk and by direct contact, so few clinical cases seem to occur. Various solutions have been suggested, such as the low virulence of *Br. abortus* strains in this country, the acquirement of immunity in childhood by drinking infected milk, the existence of a high natural immunity (quite apart from any acquired immunity), the occurrence of large numbers of mild unrecognized cases, etc. It seems probable that all these explanations are true to a greater or less extent, but the problem remains very obscure. The virulence of most bovine strains for man appears to be rather low, though laboratory infection is very frequent. The acquirement of an active immunity in childhood is difficult to exclude, and is supported by the comparatively low incidence of the disease in childhood, but such immunity, if it exists and extends its protection into adult life, would not appear to be closely associated with the formation of specific agglutinins, as only a very small proportion of large series of adult blood sera submitted for other diagnostic tests have been shown to agglutinate *Br. abortus*. Thus J. D. A. Gray<sup>6</sup> found that only 275 out of 2116 sera submitted for the Wassermann reaction caused complete or partial agglutination of *Br. abortus*

at a titre of 1-30, and Parry Morgan,<sup>7</sup> examining 1325 sera sent for the same test, found only 6 which gave partial agglutination up to 1-40 and one agglutinated up to 1-50. A number of other similar series have also been reported. It should be noted that a titre of 1-100 is usually regarded as being the minimum titre justifying a diagnosis of undulant fever, and nearly all patients with this or a higher titre for their blood serum have been found to be suffering or to have recently suffered from undulant fever. The probability that a considerable number of mild cases of the disease pass unrecognized is suggested by the long time which often elapses before the correct diagnosis is made, the lack of knowledge of the disease shown by large numbers of medical men in this country, the frequency with which cases are discovered by the application of the agglutination test as a routine to all 'Widal bloods', and the great variety of clinical manifestations found in this disease, the reviewer having recorded 78 different signs and symptoms in a series of 200 cases, and 35 diagnoses (other than that of undulant fever) in 91 of these cases.

G. S. Wilson<sup>8</sup> has pointed out that in those laboratories in which 'Widal bloods' are put up against a suspension of *Br. abortus* as a routine, the numbers of bloods agglutinating, respectively, organisms of the enteric group and *Br. abortus* to a significant titre are in the proportion of roughly 6 to 1. If this factor is applied to the number of cases of enteric fever notified year by year, the number of cases of undulant fever so deduced would be 379 for 1931, 424 for 1932, and 293 for 1933, whereas the actual number of cases coming to the notice of the reviewer were 40 for 1931, 60 for 1932, and 56 for 1933.

**Agglutination Test.**—A positive agglutination test for *Br. abortus* is given in nearly all cases of undulant fever after the fifth (or occasionally the eighth) day. A titre of 1-80 or 1-100 is usually considered as diagnostic of a present or recent infection, but it seems probable from the work of G. S. Wilson and A. A. Miles<sup>9</sup> and others that if a suitable antigen (i.e., prepared from a perfectly 'smooth' strain) is used for the test, non-specific reactions, even in low titres, will not be encountered. The average titre for 255 cases in the reviewer's series was just under 1-1500, and very high titres (e.g., 1-10,000) are not uncommon in this disease. Owing to the frequent occurrence of pro-zones and para-zones (they occurred in 10.7 per cent of the cases in the present series) the test should be spread over a large range of dilutions. Doubt as to whether the *Br. abortus* infection is active or past may often be resolved by repeating the test after an interval of a week or so, a rising titre indicating active infection. This would not of course necessarily apply to a late stage of the disease, when a dying down of the infection may be accompanied by a fall in the agglutinin content of the blood.

**Intracutaneous Reaction.**—An intracutaneous reaction with a killed suspension of *Br. abortus*, a fat-free antigen, or a filtrate of a broth culture of the organism has been employed with considerable success by J. D. Goldstein,<sup>10</sup> Arbatskaia and Moroskin,<sup>11</sup> W. Levin,<sup>12</sup> E. P. Johns, F. J. H. Campbell, and C. Tennant,<sup>13</sup> and others. The test, which resembles closely the Schick test for diphtheria, is probably not so reliable as the agglutination test, but is stated to give positive results in some cases in which no agglutinins can be demonstrated. In all the 6 cases of the reviewer's series in which the test was done it was positive, being strongly positive in a case with an agglutinin titre of 1-125 and weakly positive in a case with a titre of 1-1280. It can be regarded as a useful adjuvant diagnostic method and deserves a more extensive trial in this country.

**Blood-count.**—The two commonest features of the blood-count in undulant fever are anaemia and an actual or relative lymphocytosis. In one-third of the



cases in the reviewer's series in which the erythrocyte count was noted this was less than 4.5 millions per cubic millimetre, and in 13 per cent it was less than 3.5 millions. In 65.7 per cent of the cases in which a differential white count was done it was found that the lymphocytes constituted more than 40 per cent of the cells counted, and in 45.2 per cent they formed more than 50 per cent.

**Culture.**—*Br. abortus* is a rather fragile organism and is easily overgrown in culture by other more vigorous growths. Many strains, moreover, require the presence of 10 per cent carbon dioxide in the atmosphere if they are to grow. The organism has been frequently isolated from blood and urine and also occasionally from faeces, throat swabs, pus from an abscess, etc. In the reviewer's series blood culture was successful in 10 out of 77 cases (13 per cent) in which it was attempted, and the organism was also grown from the urine in 4 out of 47 cases (8.5 per cent), once from an osteomyelitis abscess, and once from the spleen post mortem. Twenty-one attempts to grow it from the faeces were unsuccessful, and the same was true for a throat swab and two specimens of cerebrospinal fluid. Specimens of blood for culture should be taken at the height of the fever, kept as near body temperature as possible, and after defibrination sown in 5-c.c. quantities in at least two flasks containing 100 c.c. or more of liver infusion broth as soon as possible (G. S. Wilson<sup>14</sup>). One of these flasks should be incubated aerobically at 37° C., and the other in an atmosphere containing 10 per cent CO<sub>2</sub>. These cultures should be plated out every five days on liver infusion agar, incubating the plates both aerobically and in 10 per cent CO<sub>2</sub>. As the organism is usually very slow-growing, the flasks should not be discarded until the expiration of five weeks or until positive subcultures have been obtained.

In fatal cases culture should be attempted from the spleen, liver, and mesenteric glands.

REFERENCES.—<sup>1</sup>*Jour. Compar. Pathol. and Therap.* 1934, xlvii, 181; <sup>2</sup>*Ibid.* 1935, xlviii, 43; <sup>3</sup>*Lancet*, 1932, i, 1279; <sup>4</sup>*Ibid.* 1934, i, May 5, 967; <sup>5</sup>*Bull. Off. internat. d'Hyg. pub.* 1935, xxvii, 5, 898; <sup>6</sup>*Jour. of Bacteriol.* 1933, xxv, April, 415; <sup>7</sup>*Lancet*, 1932, i, 1067; <sup>8</sup>*Vet. Record*, 1932, xii, 1226; <sup>9</sup>*Brit. Jour. Exper. Pathol.* 1932, xiii, Feb. 1; <sup>10</sup>*Jour. Clin. Invest.* 1934, xiii, March, 209; <sup>11</sup>*Gior. Batter. e Immunol.* 1934, xii, 979; <sup>12</sup>*Jour. Lab. and Clin. Med.* 1930, xvi, Dec., 275; <sup>13</sup>*Canad. Med. Assoc. Jour.* 1932, xxvii, Nov., 490; <sup>14</sup>*Brit. Med. Jour.* 1930, ii, Oct. 25, 679.

Sir Leonard Rogers, M.D., F.R.C.P., F.R.S.

To the many difficulties in the early clinical recognition of undulant fever must now be added an indefinite chronic type with slight or even no definite symptoms. This has been described under the term 'chronic brucellosis' by Alice C. Evans,<sup>1</sup> who has done much valuable serological work on the subject. An ambulant form had been recognized in 1907 by Shaw in Maltese dockyard employees with fever for a few days or not at all; and Hardy reported 25 per cent of ambulant cases in Iowa. Similar cases have been met with among persons working with the carcasses of hogs, and they may only be detected by agglutination or cultural tests. Lumbar pain and spondylitis may result in man from such infections, or neurasthenia may be the main symptom. Intradermal tests may be of value in detecting them. Very similar experience is reported from the South of France by J. Jullien,<sup>2</sup> who found symptoms of chronic rheumatism, with hip or sacral pain, among the 15 to 20 per cent of chronic cases among *Brucella* infections. Nervous symptoms, including sciatica, may also be met with. Secondary coli and coccal infections may complicate the cases, when vaccines made from those organisms may be of value in treatment, which is otherwise purely preventive.

R. M. Johnson<sup>3</sup> has reported three cases of undulant fever in which the diagnosis was obscured by the occurrence of a chronic form of pneumonia.

**TREATMENT.**—The injection of *melitine* made from an eight-week filtrate of *Brucella melitensis* is reported on by J. E. Debeno,<sup>4</sup> who obtained abortion of the fever in 58 out of 68 cases seen during the first pyrexial wave by the injection of two to five doses of 0.5 to 0.8 c.c., but in chronic cases the effect was less striking.

**REFERENCES.**—<sup>1</sup>*S. African Med. Jour.* 1934, ciii, Sept., 665; <sup>2</sup>*Presse méd.*, 1935, xliii, March 20, 451; <sup>3</sup>*Amer. Jour. Med. Sci.*, 1935, clxxxix, April, 483; <sup>4</sup>*Lancet*, 1935, i, Feb. 16, 375.

## URETER, SURGERY OF.

Hamilton Bailey, F.R.C.S.

**Complete Ureterectomy.**—It is becoming more evident that in several conditions it is advisable to excise the entire ureter as well as the diseased kidney. The study of papillary tumours of the pelvis of the kidney and primary tumours of the ureter has been stimulated by numerous case reports. Various methods of ureterectomy which have been practised were inadequate in dealing with these types of case. In a case of papilloma of the renal pelvis described by C. A. R. Nitch<sup>1</sup> recurrence occurred in the bladder near the ureteric orifice; this recurrence ultimately proved fatal. It is necessary, therefore, to remove every trace of the ureter in this condition. J. A. Colston<sup>2</sup> advises the following technique. The operation can be done in one or two stages, according to the discretion of the operator, but in the average case a one-stage operation is best. Nephrectomy is performed in the usual manner through a lumbar incision. The ureter is divided between ligatures with an electric cautery, the mucosa of both stumps being cauterized most thoroughly. The distal end of the ureter is freed as far as possible and pushed down towards the pelvis. The lumbar incision is closed. With the patient rolled on to his back, through a muscle-splitting incision the ureter is freed down to its entrance into the bladder. It is very desirable to have the bladder moderately distended with fluid during this part of the operation. The ureter is divided close to the bladder, after which its intramural mucosa is destroyed with a coagulating electrode (*Plate LXXI*). The stump of the ureter is then ligated. In this way every trace of the ureter is removed.

Other indications for nephro-ureterectomy are tuberculosis of the kidney, particularly when the ureter is involved, and hydro-uretero-nephrosis, especially when infected.

**Pyelitis.**—A. Ellis<sup>3</sup> has found that when the symptoms of acute pyelitis are not controlled by alkalization of the urine an indwelling ureteral catheter for forty-eight hours often acts dramatically. The temperature falls quickly and pain is relieved at once. In cases of chronic pyelitis renal lavage with colloidal silver relieves the pain and in many instances is of unquestionable benefit. Not infrequently such patients are equally relieved by the passage of a ureteral catheter and the making of a retrograde pyelogram. No case of pyelitis should be considered satisfactorily explained until some cause of urinary obstruction within the bladder, ureter, or pelvis has been demonstrated.

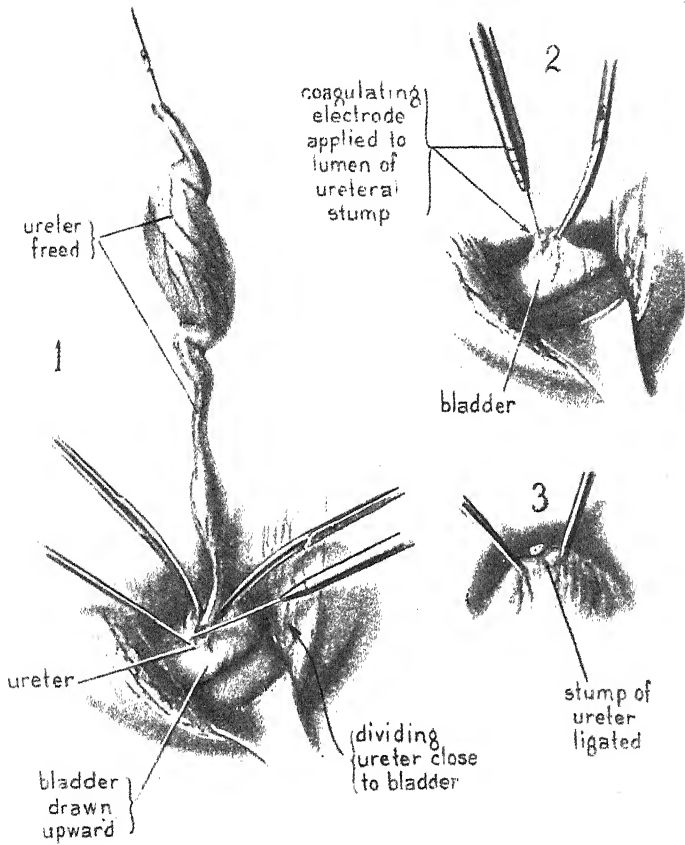
**Ureteric Calculus.**—When the stone is in the lower part of the ureter S. Power<sup>4</sup> says the first thing to be done is to enlarge the ureteric orifice. This can be accomplished by scissors at the lower end of a long flexible cable passed through the cystoscope. If the ureteric orifice is grossly cedematous, the same effect can be produced, but less accurately, by a diathermy electrode. Injection of local anæsthetic up the ureter by a ureteric catheter is also helpful. It can be stated definitely that the great majority of ureteric stones pass either spontaneously or as the result of instrumental treatment.

A. E. Roche<sup>5</sup> suggests that about 70 per cent of ureteric calculi pass naturally. He says that expanding dilators and other contrivances should be used only in the lowest inch of the ureter.

PLATE LXXI

COMPLETE URETERECTOMY

(J. A. COLSTON)



Colston's method of performing complete ureterectomy. The ureter is divided close to the bladder, after which its intramural mucosa is destroyed by diathermy.

*By kind permission of the 'Journal of Urology'*



F. E. B. Foley<sup>6</sup> says that the management of a ureteral stone by expectancy and manipulation has been employed too extensively. Only stones of truly minute size should be allowed to pass or should be treated conservatively.

When a ureteral stone is impacted in the extreme lower end of the ureter H. Wade<sup>7</sup> advises that it be approached, not by opening the ureter, but by opening the bladder suprapubically. The ureteral orifice on the affected side is viewed, the stone located by a delicate probe, and the ureter slit up from where it enters the bladder and the stone extracted.

**Accidental Injuries to the Ureter.**—I. R. Sisk<sup>8</sup> advises that when a ureter has been cut accidentally a ureteric catheter should be passed each way from the point of injury, and over the catheter an end-to-end anastomosis be made

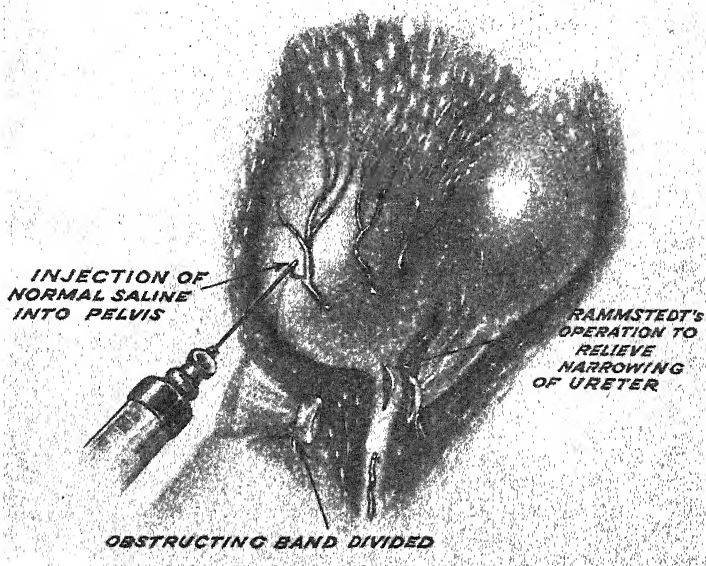


Fig. 72.—Obstruction at the uretero-pelvic junction. The obstruction has been made more evident by injecting saline into the pelvis of the kidney. An obstructing band has been divided and the stricture of the ureter relieved by Rammstedt's operation. (After C. Y. Bidgood and D. G. Roberts.)

with fine catgut. The catheter may be left in place for many days to prevent contraction of the lumen during healing. The catheter is removed in due course with the operating cystoscope.

**Obstruction at the Uretero-pelvic Junction.**—C. Y. Bidgood and D. G. Roberts<sup>9</sup> discuss obstructions at the uretero-pelvic junction. When the parts are displayed at operation the obstruction is made more evident by injecting saline into the pelvis of the kidney (Fig. 72). In certain cases of stricture of this portion of the ureter an operation akin to Rammstedt's operation for pyloric stenosis of infants is effective. A longitudinal incision of about  $1\frac{1}{2}$  cm. is made in the narrowed area of the ureter and extended through the muscular layers only, and the mucosa is seen to bulge through the defect. The pelvis

of the kidney is again injected with saline, and is seen to empty easily. The operation is completed by nephropexy. In other cases this procedure is insufficient, and a few of these can be remedied by making a longitudinal incision into the strictured portion of the ureter and sewing it up transversely.

**Uretero-intestinal Anastomosis.**—There are a number of papers dealing with modifications in technique of Coffey's method of implanting the ureters into the bowel. One of the most important appears to be that of F. Hinman,<sup>10</sup> who uses Coffey's operation ('Technic 3') (see MEDICAL ANNUAL, 1934, p. 511), but a ureteric catheter is placed in the ureter above the anastomosis and brought out extraperitoneally. This, it is claimed, mitigates infection.

REFERENCES.—<sup>1</sup>*Brit. Jour. Urol.* 1934, vi, 349; <sup>2</sup>*Jour. of Urol.* 1935, xxxiii, 110; <sup>3</sup>*Lancet*, 1935, ii, 127; <sup>4</sup>*Practitioner*, 1935, cxxxiv, 678; <sup>5</sup>*Proc. Roy. Soc. Med. (Urol. Sect.)*, 1935, xxviii, 589; <sup>6</sup>*Jour. Amer. Med. Assoc.* 1935, civ, 1314; <sup>7</sup>*Proc. Roy. Soc. Med. (Urol. Sect.)*, 1935, xxviii, 582; <sup>8</sup>*Surg. Gynecol. and Obst.* 1935, lx, 857; <sup>9</sup>*New Eng. Jour. Med.* 1935, cccxii, 705; <sup>10</sup>*Surg. Gynecol. and Obst.* 1935, lx, 1115.

## URETHRA, SURGERY OF.

Hamilton Bailey, F.R.C.S.

**Urethrography.**—This is a splendid method of investigating the urethra in young children. I. Mihalovici<sup>1</sup> injected a 50 per cent solution of thorotrast into the urethra of an infant suffering from dysuria. The subsequent X-ray showed a narrow stricture of the urethra at the peno-scrotal junction. After the stricture was dilated the infant voided urine normally.

### Stricture of the Urethra.—

**Stricture of the External Urinary Meatus.**—Acquired stricture of the external meatus quite commonly affects elderly and old men. A. R. Thompson<sup>2</sup> finds that the most potent cause of this condition is chronic meatitis associated with phimosis and want of cleanliness. Other causes are gonorrhœa, meatal chancre, and (rarely) badly performed circumcision. Those most resistant to treatment are meatal strictures due to healed chancres.

In cases of intractable stricture of the urethra which has not involved the posterior part of the bulbous urethra, J. D. Barney<sup>3</sup> transplants the urethra behind the stricture into the perineum. The urethra behind the stricture is always found to be dilated, and by careful dissection it can be freed and brought out in the perineum, where it is sutured to the skin. There must be absolutely no tension. If properly performed, retraction of the stump of the urethra takes place until it finally presents a button of mucous membrane emerging through the skin. The patient must void urine in a squatting position, and this is the only drawback. [Excision of the stricture after the manner of Hamilton Russell is so successful in this type of case that the need for Barney's method would appear to be very limited.—H. B.]

**Stricture following Rupture of the Deep Urethra.**—Complete rupture of the deep urethra (intrapelvic rupture), unless treated skilfully soon after the accident, leads to one of the most hopeless forms of urethral stricture. The prostate becomes displaced backwards and the continuity of the urethra is separated by a wide gap filled with scar tissue. E. M. Watson<sup>4</sup> has devised an operation to restore the continuity of the urethra. Through a U-shaped incision in the perineum the distal end of the urethra and the apex of the prostate are identified and the scar tissue is excised. By using two flaps cut from the distal urethra the gap is bridged over a retained catheter in the manner shown in Fig. 73. In three cases perfect results were obtained; one has been free from stricture formation for eleven years. This is a great triumph in a class of case which has been the despair of surgeons heretofore.

**Anæsthesia of the Urethra.**—Before attempting to pass a catheter in cases of acute retention, F. M. Loughnane<sup>5</sup> recommends that the urethra should be anesthetized in the following manner: 2 drachms of an efficient local

anæsthetic are injected by means of a 10-c.c. Record syringe. The meatus is clamped so as to retain the anæsthetic in the urethra for five minutes. The anæsthetic is then massaged back into the posterior urethra and one waits again for the anæsthetic to take effect. Local anæsthetics recommended are  $\frac{1}{2}$  per cent cocaine, 2 per cent novocain, or 1 per cent pheolaine. The last is more expensive, but has the advantage of being antiseptic as well as anæsthetic. To prevent instrumental infection 1 oz. of 1 per cent silver nitrate solution should be injected into the empty bladder and left there.

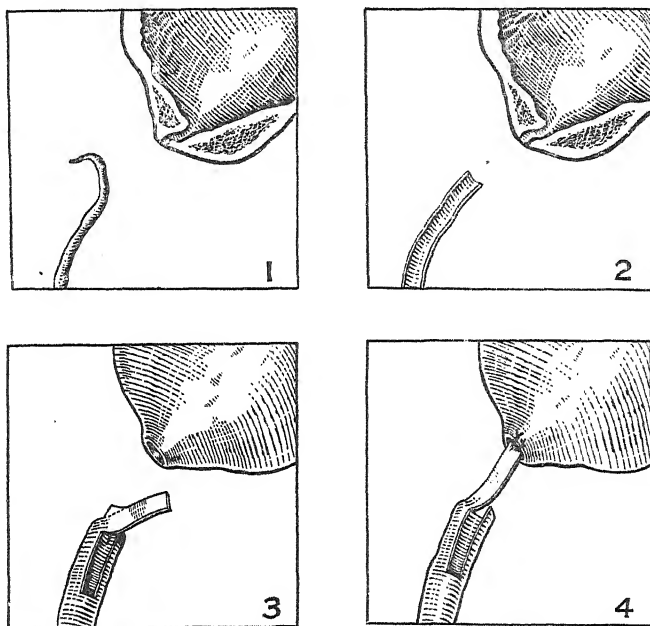


Fig. 73.—Elastic repair of the deep urethra in cases of stricture following rupture of the deep urethra. (After E. M. Watson.) (Re-drawn from the 'Journal of Urology'.)

**Granular Urethritis in Women.**—J. K. Ormond<sup>6</sup> believes the most common urinary ailment in women is due to a non-purulent urethritis, which he calls 'granular urethritis'. The commonest symptoms are frequency and dysuria. Frequency is the chief symptom, and often the only one. It is apt to be more troublesome in the morning than the rest of the day. Cystoscopy and all other investigations are negative. Only too often the urethra is not examined. For inspecting the urethra Ormond uses a half length of Kelly's endoscope, and it is necessary to have more than one size of instrument. In a typical case a smooth, glistening urethral mucous membrane is replaced by a rough, granular appearance, from which the condition takes its name. Treatment is simple, and usually extremely effective. The urethra should be dilated gradually with Hegar's dilator, followed by an instillation of mercurochrome or argyrol. If this does not give relief soon, application through the endoscope of 10 per cent silver nitrate solution to the upper pole of the urethra and the bladder neck often gives striking results.

**The Operative Treatment of Urinary Incontinence.**—B. S. Abeshouse<sup>7</sup> reports the successful use of the gracilis muscle transplanted to make a new sphincter urethrae in cases of urinary incontinence. The muscle has a double nerve-supply which, together with its artery, enters the muscle close to its origin. The gracilis muscle is easily accessible and is not essential for locomotion. It can be used as a new sphincter urethrae in both the male and the female. The technique of the operation in the male is illustrated in *Plate LXXII*, which shows the muscle being made to encircle the bulb of the corpus spongiosum.

C. L. Deming<sup>8</sup> says that 9 cases of gracilis muscle transplantations have been reported by six different surgeons with 8 excellent results.

REFERENCES.—*Jour. de Urol.* 1934, xxxvii, 516; <sup>2</sup>*Lancet*, 1935, i, 1373; <sup>3</sup>*New Eng. Jour. Med.* 1934, cxxi, 759; <sup>4</sup>*Jour. of Urol.* 1935, xxxiii, 64; <sup>5</sup>*Brit. Med. Jour.* 1935, i, 1115; <sup>6</sup>*Jour. of Urol.* 1935, xxxiii, 483; <sup>7</sup>*Ibid.* 28; <sup>8</sup>*Ibid.* 73.

## URINARY THERAPEUTICS.

Hamilton Bailey, F.R.C.S.

**Intravenous Sodium Sulphate as a Diuretic.**—Until recently the best method of endeavouring to produce diuresis in the case of oliguria and anuria has been the continuous intravenous infusion of normal saline and glucose. I. L. Dick<sup>1</sup> finds that the continuous administration of an isotonic solution of sodium sulphate is superior to normal saline. In every case the diuresis produced by the sodium sulphate was greater than that induced by sodium chloride. In no case is there any evidence of storage of sodium sulphate in the body. An isotonic solution of sodium sulphate is made by dissolving 42.85 grm. of Glauber's salt in 1 litre of water. In the first case in which this solution was used its action was definitely life-saving. The case was one of acute renal cortical necrosis of pregnancy. The patient had passed no urine for four days and the bladder was empty. Two litres of an isotonic solution of sodium sulphate was allowed to gravitate into the vein. Nothing happened, and the patient became uræmic in the extreme. On the fifth day the infusion was repeated. In a few hours she began to micturate; improvement was maintained, and by the sixteenth day the blood chemistry was normal.

**Acidification of the Urine with Nitrohydrochloric Acid.**—A. M. Crance and T. W. Maloney<sup>2</sup> consider that it is the strength of the acidity of the urine rather than any specificity of the  $\beta$  oxybutyric acid which destroys the growth of the colon bacillus. They find that nitrohydrochloric acid reduces the  $P_{H}$  value of the urine to five or below, apparently in less time than the ketogenic diet. If this is so, it will prove to be a great boon, for the ketogenic diet is expensive, nauseating, and necessitates institutional treatment. The nitrohydrochloric acid treatment can be undertaken without hospitalization and without a change from ordinary diet. The treatment is applicable especially to cases of *B. coli* bacilluria. The first thing is to determine the type of *B. coli* which is the infecting agent.

**Determining the Type of *B. coli*.**—Before any uniformity in results can be expected, standardization in laboratory methods must be adopted. The two principal types of *B. coli* are the *aerogenes* and the *Escherichia*. Both produce gas in lactose in forty-eight hours, whereas only the *aerogenes* type produces gas in saccharose. Consequently, if after forty-eight hours the saccharose tube shows no gas, the type is considered to be *Escherichia*, and likewise the type most suitable for the nitrohydrochloric acid treatment.

Treatment consists of giving the patient the following mixture :—

R	Acid. Nitrohydrochlor. Fort.	..	..	..	3iv
	Aquam Dest. ..	..	..	ad	3iv

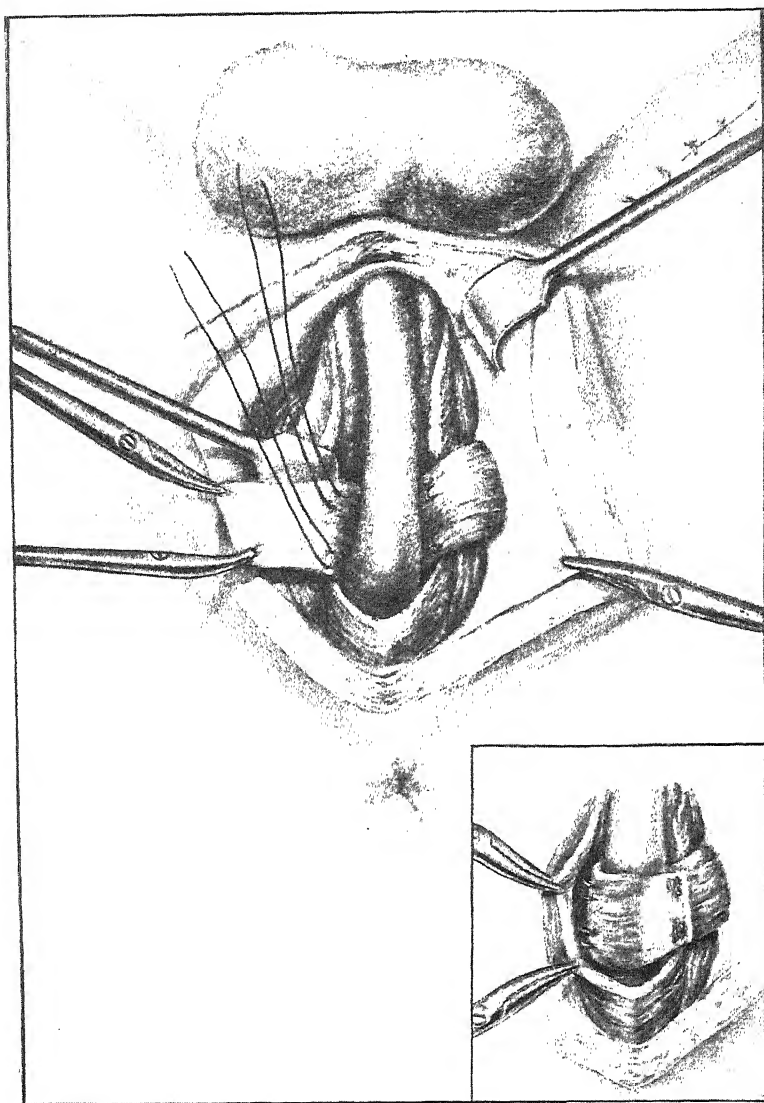
3j in two-thirds glass of water followed by a full glass of water after meals and late at night.



*PLATE LXXII*

OPERATIVE TREATMENT OF URINARY INCONTINENCE

(R. S. ABESSHOUSE)



Transplantation of gracilis muscle to make a sphincter urethrae.



The medication should be continued for approximately one week after the cultures of the urine have become sterile.

**Mandelic Acid.**—The introduction of mandelic acid\* as a urinary antiseptic is the result of research based on the fact that urinary sepsis is checked by the administration of a ketogenic diet. Unfortunately,  $\beta$  oxybutyric acid cannot be administered by mouth, for it is destroyed in the intestine. M. L. Rosenheim<sup>3</sup> investigated the action of a series of organic acids and found that mandelic acid had an antiseptic action equal to that of oxybutyric acid, and, what was of fundamental importance, could be given by mouth and was excreted unchanged in the urine. Mandelic acid has been shown by clinical experiments to be particularly effective in cases of chronic *B. coli* pyuria. The therapeutic dose is 12 grm. per day, and it is given with sodium bicarbonate to prevent gastric irritation. It is necessary at the same time to make the urine distinctly acid to litmus, and this is done by administration of ammonium chloride or acid ammonium phosphate (*see* MEDICAL ANNUAL, 1934, p. 513). Sodium mandelate is a later product which is better tolerated than the original mandelic acid.

**The Prevention of Recurrence of Urinary Calculi.**—S. Power<sup>4</sup> suggests the following. In oxalate calculi spinach, rhubarb, asparagus, and strong tea, coffee, and cocoa should be avoided. There must be a full vitamin intake. Vegetable fermentation in the intestine should be mitigated by the ingestion of alkalis. In uric acid concretions the purin intake should be reduced.

L. D. Keyser<sup>5</sup> advises that dietary regulations with regard to the intake of purins, oxalates, calcium, or phosphorus are indicated according to the predominant chemical found in the analysis of the calculus. A high intake of vitamin A deserves a clinical trial. In cases of oxalic, carbonate, and phosphate calculi intense acidification of the urine should be obtained, while alkalization will be indicated in urate and cystine calculi.

**The Action of Morphia upon the Human Ureter.**—N. F. Ockerblad et al.,<sup>6</sup> by a convincing series of experiments, show conclusively that the usual notion that morphine quiets ureteric peristalsis is entirely erroneous. Morphia stimulates the ureter. Invariably atropine in doses of  $\frac{1}{100}$  gr. wipes out the contractions stimulated by the morphine. Atropine does not act strikingly or constantly when given alone.

**Acetylcholine in Post-operative Retention of Urine.**—J. T. Gernon et al.<sup>7</sup> find acetylcholine a good parasympathetic stimulant to the bladder, and recommend its use in post-operative retention of urine and in other conditions, particularly organic nervous disorders, which render the complete emptying of the bladder ineffective.

**A New Urinary Antiseptic.**—Picrochrome† is one of the latest antiseptics. A. Ravich<sup>8</sup> and C. H. Chetwood and M. W. Mason<sup>9</sup> are favourably impressed with it. They find that it acts equally well in an acid or an alkaline medium, and it destroys coliform bacilli as well as cocci. It is potent in high dilutions, and well tolerated orally and intravenously. Its only drawbacks are that it tends to produce diarrhoea and it colours the urine red.

**The Treatment of Acute Pyelitis.**—"The treatment of acute pyelitis is extraordinarily simple," says Professor A. Ellis.<sup>10</sup> It consists in the administration of adequate doses of alkali for a sufficiently prolonged period, but the alkalization must be adequate and sufficiently prolonged. Potassium citrate, 60 gr. in  $\frac{1}{2}$  oz. of water, with syrup of orange to flavour, is the prescription

\* Supplied by Boots Pure Drug Co. Ltd., Nottingham.

† Obtainable from W. Martindale, 12, New Cavendish Street, London, W.1.

recommended. It is given two-hourly for eight days, and then four-hourly. If, after thirty-six hours, the urine is still acid, two-hourly doses should be given again. After that sufficient alkali is given to keep the urine alkaline to litmus. A common error is to substitute the alkali for sodium acid phosphate and hexamine too early. Ellis has discarded entirely the use of hexamine in these cases. When alkalinization fails to remedy matters quickly, continuous drainage of the renal pelvis through a ureteric catheter left *in situ* for about forty-eight hours relieves the pain at once, the temperature falls, and the toxic manifestations disappear.

REFERENCES.—<sup>1</sup>*Edin. Med. Jour.* 1934, xli, 203 (*Med.-Chir. Trans.*); <sup>2</sup>*Jour. of Urol.* 1935, xxxiii, 657; <sup>3</sup>*Lancet*, 1935, i, 1632; <sup>4</sup>*Practitioner*, 1935, cxxxiv, 678; <sup>5</sup>*Jour. Amer. Med. Assoc.* 1935, civ, 1299; <sup>6</sup>*Jour. of Urol.* 1935, xxxiii, 356; <sup>7</sup>*Med. Record*, 1935, cxli, 141; <sup>8</sup>*Ibid.* 343; <sup>9</sup>*Urol. and Cutan. Rev.* 1935, xxxix, 241; <sup>10</sup>*Lancet*, 1935, ii, 127.

## VACCINATION.

J. D. Rolleston, M.D., F.R.C.P.

EPIDEMIOLOGY.—Lasnet,<sup>1</sup> Director General of Public Health in Algeria, states that owing to the systematic vaccination carried out in the urban and rural districts only 29 cases of small-pox occurred during 1934 in Algeria, as compared with several thousands in previous years. Of these, 5 were in the province of Algiers, 18 in Oran, 2 in Constantine, and 4 in the southern territories.

SYMPTOMS AND COMPLICATIONS.—H. H. Donnally and M. M. Nicholson<sup>2</sup> record their experience of vaccination of 500 *newborn infants*, in whom a single insertion was made just below the head of the left fibula. Their conclusions are as follows: (1) Vaccination of newborn infants is a safe procedure with negligible complications, insignificant influence on growth and nutrition, and almost always without fever. (2) Ten per cent of the infants were resistant to vaccination, possibly owing to the resistance of growing young tissues. (3) In successful cases the active immunity develops promptly and may last for over a year and probably longer. (4) Vaccination at birth is a practicable means of increasing protection against small-pox in those prone to do without this protection until forced to obtain it at school age. (5) For those who will be vaccinated between 3 and 6 months of age, when success is more likely, vaccination need not be performed at birth. J. V. Lukacs and D. Moritz<sup>3</sup> found that susceptibility to vaccination in children on the second day of life was less than was generally supposed, as in only 47.5 per cent of their cases was the operation successful on that date as compared with 92 per cent in older infants. This relative resistance to vaccination could be overcome partly by the use of concentrated lymph and partly by the scarification extending over a large area. The resistance did not appear to depend on the mother's degree of immunity but on the peculiarities of the newborn infant, the vaccinal reaction being sometimes positive in the mother and negative in the child, and vice versa. As regards the development of the reaction in control infants, the papule first appeared on the sixth or seventh day, and reached its fullest development on the tenth or eleventh, whereas in the newborn the reaction did not reach its fullest development until the fourteenth or fifteenth day. Lastly, whereas vaccination in older infants is almost always a febrile process, in the newborn fever was hardly ever noticed by the authors.

The *duration of immunity to small-pox*, as shown by the results of vaccination, was investigated by W. P. Dearing and H. S. Davidson<sup>4</sup> in 557 students who had been vaccinated and in 9 who had never been vaccinated but had had small-pox. Of 337 revaccinated ten years or less after primary vaccination only 1 showed a primary take, 15 (4.7 per cent) had an accelerated reaction, and 321 (91.5 per cent) an immediate reaction. Of 128 vaccinated from ten

to nineteen years previously, only 6 (4 per cent) showed primary takes, 50 (29 per cent) accelerated takes, and 112 (67 per cent) immediate reactions. After twenty years, of 52 reactions, 35 (67 per cent) were immediate, 13 (25 per cent) were accelerated, and 4 (8 per cent) gave primary takes. Immunity therefore conferred by a single vaccination usually lasts longer than six to ten years. Vaccination of the 9 students with a history of small-pox gave 4 primary takes, 4 accumulated takes, and only 1 immediate reaction. Small-pox therefore does not protect so well against cow-pox as does vaccination.

K. C. Chaudhuri<sup>5</sup> illustrates the rarity of *generalized vaccinia* by the fact that during the period 1914-28 only 21 cases, of which 6 were fatal, occurred among 22,000,000 vaccinations or re-vaccinations in Germany. In the newborn the condition is extremely rare, as the author was unable to find a single case after a close search of the literature of the last twenty years. He reports two typical cases from his own experience at Calcutta, one in a male infant vaccinated within two hours of birth and the other in a female vaccinated on the twentieth day of life. Neither infant showed any systemic reaction during the incubation period of ten and fourteen days respectively. The male infant recovered after a severe illness in which he had an extensive crop of lesions all over the face, body, and extremities. The female infant died after a generalized eruption on the twelfth day of disease, death being preceded by convulsions. There was no autopsy. Although conclusions cannot be drawn from only two cases, Chaudhuri doubts if vaccination in the newborn is indispensable, especially as small-pox is not a common cause of death at this age in Calcutta.

According to F. A. Ellis,<sup>6</sup> who records two cases in twins, one of which was fatal, *eczema vaccinatum* and *generalized vaccinia* are essentially the same, the virus being disseminated by the blood-stream.

According to official statistics,<sup>7</sup> the incidence and fatality of *post-vaccinal encephalitis* in certain countries during 1933 and 1934 were as follows: In England 4 cases with 3 deaths were reported in persons aged from 4 to 18 after primary vaccination between September, 1933, and October, 1934, the symptoms in each case appearing on the thirteenth or fourteenth day after vaccination, and there was 1 mild case in a man following re-vaccination. In Germany in 1933 there were 14 cases with 1 death following primary vaccination and 5 cases with 2 deaths after re-vaccination. In the first six months of 1934 there were 3 cases with 1 death after primary vaccination and 2 cases with 1 death after re-vaccination. In the United States in 1933, in addition to 5 cases in children aged from 3 to 9 years from eleven to nineteen days after primary vaccination, there were 3 cases about which there were no details. In Holland there were 8 cases notified in 1933; 3 of them, however, were excluded after examination by the official neurologist, who also regarded some of the remaining 5 as doubtful. As the number of vaccinations in Holland was 26,000, the average proportion of 1 case to every 5000 vaccinations remained the same as in previous years. In the first six months of 1934, when 10,000 vaccinations were performed, 2 cases were reported. In Norway 28 cases with 11 deaths were reported during the period 1930-3. Of 18 children who had been vaccinated before or after 1930 and had survived the complication, 17 had completely recovered and only 1 was still paralysed. In Sweden only 3 mild cases were notified in 1934, and there had been no fatal case since 1932, the number of vaccinations remaining about the same. In Belgium, where about 100,000 vaccinations were performed yearly, there was only 1 case following primary vaccination in a girl aged 12 years. The symptoms developed twelve days after primary vaccination, and death took place after a few days' illness. No case was reported in British India. Since this report was published,

however, J. C. Banerjee<sup>8</sup> has recorded the case of a female infant aged 1 year and 10 months, who on the thirty-fifth day after primary successful vaccination developed paralysis of all four limbs and the trunk. She had been vaccinated with two insertions on each arm. On the twenty-fifth day, an abscess had appeared in the left axilla associated with a remittent temperature of 101°-102° for six days. The patient's elder sister, aged 4, and six other members of the family who were vaccinated with the same lymph did not have any complications.

E. de Gregorio<sup>9</sup> describes an outbreak of 23 cases of *ringworm of the skin* due to *Trichophyton faviforme discoides* which developed about two months after vaccination. Most of the cases were soon cured by tincture of iodine, while the rest which were refractory to this treatment were rapidly cured by chrysophanic acid. The brilliant green which was used for the preservation of the lymph was found to be sterile, so that the lymph itself was responsible for the outbreak. The author was unable to find any previous record of such an extensive epidemic of ringworm following vaccination.

REFERENCES.—<sup>1</sup>*Bull. Off. internat. d'Hyg. publ.* 1935, xxvii, 273; <sup>2</sup>*Jour. Amer. Med. Assoc.* 1934, ciii, 1269; <sup>3</sup>*Arch. f. Kinderheilk.* 1935, cv, 1; <sup>4</sup>*Jour. Amer. Med. Assoc.* 1934, cii, 1998; <sup>5</sup>*Ind. Jour. Pediat.* 1935, ii, 111; <sup>6</sup>*Jour. Amer. Med. Assoc.* 1935, civ, 1891; <sup>7</sup>*Bull. Off. internat. d'Hyg. publ.* 1935, xxvii, 287; <sup>8</sup>*Ind. Jour. Pediat.* 1935, ii, 177; <sup>9</sup>*Med. Ibera*, 1934, xxix, 164.

#### VARICELLA. (See CHICKEN-POX.)

#### VARICOSE VEINS.

Sir W. I. de C. Wheeler, F.R.C.S.I.

E. A. Edwards<sup>1</sup> confirms recent observations that injection treatment is often unsatisfactory in those patients in whom there is a great widening of the saphenous veins. Re-canalization occurs in the sclerosed segment, or the blood may be so diverted as to dilate a previously normal vein. In these cases it is advisable to perform a preliminary ligation of the internal saphenous vein at the sapheno-femoral junction. A sclerosing solution is injected into the divided distal segment. Subsequent injections into dilated veins below are usually necessary. A very full discussion on the treatment of varicose veins is given by Edwards. Having ascertained the exact condition of the veins, treatment is carried out along the following lines:—

"We try to determine, at the first visit of the patient:—

"1. The actual presence of varices and whether they occur in the distribution of the greater or lesser saphenous.

"2. The condition of the great saphenous vein and whether there is a positive Trendelenburg test.

"3. The condition of the valves of the perforating veins.

"4. The condition of the deep veins.

"We then proceed with our treatment:—

"1. If the varices are limited to the distribution of the lesser saphenous vein, we use the injection treatment alone. The solutions we use are: (a) Quinine urethane for the small or medium sized varices; (b) 20 per cent sodium chloride for the large varices; (c) 5 per cent sodium morrhuate for angiomas. (In private practice I prefer this solution in all cases.)

"2. If the varices are in the distribution of the great saphenous vein but the vein is not widened and the Trendelenburg test is negative, we use the injection treatment alone. If the Trendelenburg test is positive, we send the patient into the hospital for ligation at the sapheno-femoral junction, inject the distal segment with varisol (invert sugar and sodium chloride), then follow up in the out-patient department with injections as in the cases with negative Trendelenburg tests.

"3. If the Trendelenburg test is doubly positive, we ligate the saphenous, excise the incompetent perforation, and inject the remainder in the out-patient department. These cases are relatively uncommon.

"4. In cases of obliteration of deep veins, it is a good rule not to disturb the superficial varices. We have injected the varices in the lower leg in a case of occlusion of the inferior vena cava, with much improvement. In this case, however, the original deep phlebitis had not involved the deep veins of the leg proper.

"5. Patients with ulcer we treat according to the criteria laid down above, but we inject very cautiously, staying far away from the ulcer, until it is free from infection, sometimes not injecting until we have first reduced the inflammation by ligation alone, or by supportive dressings. We have never found it necessary to excise an ulcer. If there is an incompetent perforator beneath the ulcer, we believe the ulcer can be temporarily healed by ligation and injection. The perforator can then be excised several weeks after the ulcer is healed.

"6. Patients with phlebitis are treated as are patients with ulcer. The progress of the phlebitis is stopped by the ligation or small injections far from the phlebitic focus."

Large veins can be easily injected with the patient reclining, small veins are more difficult to inject unless the patient stands. A needle with a short bevel should always be used. If there is any doubt as to the needle being in the vein, the injection should not be made. Contra-indications must always be borne in mind. The following are some of the most obvious: Hyperthyroidism, severe nephritis, Raynaud's disease, severe heart lesions, obstruction to the deep venous system, and recent thrombophlebitis. The enlarged veins of pregnancy are best treated by bandaging until the pregnancy is over. (Some authorities ignore obstruction to the deep veins, and notwithstanding, recommend the treatment of the superficial varices by injection. They argue that the dilated superficial varicosities do not function and are better obliterated. The reviewer agrees with those who regard deep obstruction as a contra-indication to injection.)

G. C. McKinstrey<sup>3</sup> draws attention to these points. The ideal solution for injection treatment of varicose veins has yet to be discovered. *Quinine and urethane* has many supporters; many prefer *sugar solutions*, and many *sodium morrhuate*. He reviews the work on varicose veins for the year 1933.

N. J. Kilbourne<sup>3</sup> draws attention to certain dangers in the treatment of varicose veins. Twenty deaths which followed the treatment of varicose veins by injection were largely due to bacteræmia, infected phlebitis followed by embolism. He believes that an antiseptic solution, such as quinine urethane, is safer than solutions which are not germicidal. The original purpose of adding urethane to quinine was to render the latter soluble, but an important action of the urethane is its anæsthetic property. Sodium morrhuate is not bactericidal to the staphylococcus. "Following the more general use of sodium morrhuate fatalities are appearing. At least three have been reported from England, and of these it is known that two died from bacteræmia." Only two fatalities are on record after the use of quinine urethane solution; these were not due to infection. This is because quinine solutions are bactericidal, and kill bacteria wherever they are deposited.

Kilbourne, like other observers, recommends vein ligation high up before the injection of veins of very large calibre. He calls attention to the fact, however, that this small operation is not free from danger. The blood stagnates proximal to the ligature, and the thrombus thus formed may become detached. It is not adherent to the vessel walls to the same extent as the

thrombus produced by the injection of highly irritating solutions. He prefers to collapse the vein by an elastic adhesive bandage round the upper portion of the thigh which is changed every three or four days. Injections are made with small amounts of quinine and urethane (2 min. at first) into the veins above and below the bandage. The sclerosing effect reaches the giant vein under the bandage without making a huge thrombus. Sloughs from unsuccessful injections are common. The fact that blood can be aspirated through the needle before the injection is made is no proof that the injection is intravenous. A thin-walled vein can easily be perforated during manipulations. The needle may aspirate the blood from the surrounding hæmatoma. Although sloughs may follow the injection of sodium morrhuate or potassium oleate, they are less likely than when quinine urethane is used, and when they do occur they heal more rapidly. Kilbourne urges that a complete examination should be made before the injection of varicose veins. He mentions cases of underlying sarcoma, and also a case of obliterative arterial disease in which the patient developed gangrene and required high amputation. Fortunately, the underlying trouble was detected at the time the patient came asking for injection treatment of the varicose veins.

J. W. Riddoch<sup>1</sup> points out that sodium morrhuate has been much used for small dilated veins found in the skin. The injection is liable to be followed by a slough when other substances are used. Except for the injection of the smaller veins Riddoch has found sodium morrhuate disappointing. Its injection is often followed by red and tender swelling of the injected veins which may take three or four weeks to subside. There is apparently a wide difference in the efficiency of various samples. Kilbourne, quoted above, prefers potassium oleate; Riddoch mentions the use of a pure sodium oleate solution.

Quinine urethane or other suitable quinine solutions appear to be favoured by most authorities. The only drawbacks are the intolerance of some patients to quinine, and to test this intolerance very small injections should be given at first. Secondly, there is the sloughing which follows incorrect injections: 5 per cent solutions are the optimum strength for all-round use; 8 to 9 c.c. should be the maximum amount used at one sitting. Recently Riddoch has employed saturated solutions of *quinine lactate*, using 3 to 4 c.c. as the maximum dose. In many respects it has proved a better solution than the quinine urethane in general use.

REFERENCES.—<sup>1</sup>*Surg. Gynecol. and Obst.* 1934, Dec., 916; <sup>2</sup>*Inter. Abstr. of Surg.* 1934, Dec., 489; <sup>3</sup>*Amer. Jour. Surg.* 1934, xxv, July, 148; <sup>4</sup>*Lancet*, 1934, ii, Nov. 17, 1101.

**VASCULAR SURGERY.** (See BLOOD-VESSELS, SURGERY OF.)

**VENTRAL HERNIA.** (See HERNIA, UMBILICAL.)

**VITAMINS.** (See also SCURVY, INFANTILE.)

Ivor J. Davies, M.D., F.R.C.P.

**Vitamin A.**—Marion B. Richards<sup>1</sup> (Aberdeen) discusses the rôle of vitamin A in nutrition. The main results of her experiments showed: (1) The early occurrence of pathological conditions in young rats deprived of vitamin A; (2) The very high incidence of gastro-intestinal affections both in young and in adult animals; (3) The persistence of the pathological conditions once they have been established, in spite of subsequent dosing with vitamin A; and (4) The parallelism between the findings in rats and various reported cases of disease in human beings. With regard to the problems of vitamin A and



human nutrition, much valuable information is contained in the Medical Research Council Report on Vitamins, 1932 (reviewed in the MEDICAL ANNUAL, 1933, p. 532), in the section entitled "Vitamins and Human Diets". As far as vitamin A is concerned, many instances are given in which xerophthalmia and hemeralopia in human beings have apparently been associated with deficiency of vitamin A in the diet, and have yielded promptly to treatment with cod-liver oil or other rich source of the vitamin. It may well be, as pointed out in the M.R.C. report with regard to vitamins in general, that the damage caused by insufficiency of vitamin A in early youth cannot afterwards be made good by an adequate supply of the vitamin, and that much chronic ill health in later life may have its origin in this early deficiency. Miss Richards's paper should be carefully studied.

G. S. Shibley and T. D. Spies<sup>2</sup> (Cleveland) have studied the effect of vitamin A on the incidence, severity, and duration of the *common cold*. The material consisted of young adult volunteers observed over a period of fifty-six weeks and divided into test and control groups by random selection. It was shown by preliminary experiments with rats that vitamin A in the form of halibut-liver oil may be administered effectively in large single weekly doses. This vitamin was found to have no effect on the incidence or severity of colds. Suggestive but not conclusive evidence indicated that vitamin A shortens colds slightly in the winter months.

P. D. Crumm and D. M. Short<sup>3</sup> (Evansville, Indiana) have made spectrophotometric determinations of vitamin A content of human livers. Seven apparently healthy persons, dying sudden accidental deaths, averaged 311 I.U. of vitamin A per gramme of liver, whilst two children averaged 80 I.U. Four cases of pulmonary tuberculosis on a high vitamin diet averaged 523 I.U. of vitamin A per gramme of liver. The addition of vitamin A as halibut-liver oil stores a large quantity of vitamin A in the human liver.

**Vitamin B<sub>2</sub>.**—S. Levy Simpson<sup>4</sup> (London) reports a case of *pellagra* following gastrectomy, and apparently cured by vitamin B<sub>2</sub>. The diagnosis of secondary *pellagra* is discussed and the necessity for observing and preventing minor manifestations is stressed. The mechanism of production of secondary *pellagra* is described and its etiological significance indicated. A relationship between *pellagra* and adrenal hypofunction was found to exist.

**Vitamin C.**—D. Greene<sup>5</sup> (New York) has examined the capillary resistance test in the diagnosis of subclinical *scurvy*. He quotes A. F. Hess,<sup>6</sup> who found that there were decided individual variations in regard to the reaction to the test, and that although petechial spots are far more numerous in individuals suffering from latent or active *scurvy*, the reaction cannot be used as evidence of a deficiency in vitamin C. Greene's studies also showed that a positive reaction to the capillary resistance test does not necessarily denote an insufficiency of vitamin C.

L. J. Harris and S. N. Ray<sup>7</sup> (Nutritional Laboratory, University of Cambridge and Medical Research Council) report on the diagnosis of vitamin C subnutrition by urine analysis, with a note on the antiscorbutic value of human milk. The following summary is drawn from their paper. Infants suffering from manifest *scurvy*, or with a history of vitamin C underfeeding, excrete less vitamin C in their urine (measured chemically) than do well-nourished infants of the same age tested under the same conditions (on controlled diets low in vitamin C). The difference can be made more strikingly manifest by the administration of a large test dose of vitamin C: a marked peak results in the curve of the urinary excretion for the normal infants, but not for the 'unsaturated', scorbutic, or semi-scorbutic infants. After cure the scorbutic infant behaves like a normal infant both in his output of vitamin C on ordinary diets

(or controlled vitamin-C-free diets) and in his response after the test dose. Further observations on adults are also reported, showing that a low urinary output, and a low response to test doses, go parallel with a history of vitamin C underfeeding and with a state of vitamin C subnutrition as indicated by a lowered capillary resistance. The technique described is being used to estimate the prevalence of hypovitaminosis C among certain sections of the community. The rarity of scurvy in breast-fed infants is explained by the finding that human milk contains three to four times the amount of vitamin C that is contained in cow's milk; part of the latter is also lost generally (1) by pasteurization, (2) during standing, (3) by further heating, and (4) by dilution.

L. F. Levy<sup>8</sup> (Biochemical Department, South African Institute for Medical Research) has investigated the antiscorbutic value of some South African foodstuffs as measured by their indophenol reducing power. During the last few years, and largely as a result of the pioneer work of Szent-Györgi, the chemical nature of vitamin C has been ascertained; this substance has been named ascorbic acid, and its properties are now receiving a great deal of attention. A tabular list of the various foodstuffs is recorded and the outstanding value of the green leaf is the most apparent. It is also noted that although the concentration of vitamin is low in Kaffir beer, quite an appreciable amount will be derived from the quart ration. The antiscorbutic vitamin varies considerably from sample to sample in various fruits such as apples, oranges, and bananas.

REFERENCES.—<sup>1</sup>*Brit. Med. Jour.* 1935, i, 99; <sup>2</sup>*Jour. Amer. Med. Assoc.* 1934, ciii, Dec., 2021; <sup>3</sup>*Amer. Jour. Med. Sci.* 1935, clxxxix, April, 571; <sup>4</sup>*Quart. Jour. Med.* 1935, iv, April, 191; <sup>5</sup>*Jour. Amer. Med. Assoc.* 1934, ciii, July 7, 4; <sup>6</sup>*Amer. Jour. Dis. Child.* 1914, Dec., viii, 386; <sup>7</sup>*Lancet*, 1935, i, Jan. 12, 71; <sup>8</sup>*Jour. Med. Assoc. S. Africa*, 1935, ix, March 23, 181.

**VOLVULUS.** (See **INTESTINAL OBSTRUCTION.**)

**VULVO-VAGINITIS IN CHILDREN.** (See **GONORRHOEA.**)

**WEIL'S DISEASE.** (See **JAUNDICE, INFECTIVE.**)

### **WHOOING-COUGH.**

J. D. Rolleston, M.D., F.R.C.P.

**SYMPTOMS AND COMPLICATIONS.**—G. Mannerstedt<sup>1</sup> reports his observations on 29 cases of *pertussis in adults* aged 24 and upwards: 9 had a history of a previous attack, 13 had no such history, and in 7 the history was doubtful. The incubation period ranged from 7 to 23 days, the average being 14.5 days, and the duration of symptoms from 24 to over 80 days, the average being 6 weeks. In 6 cases Bordet-Gengou organisms were found by the cough plate method, and in 2 pertussis-like organisms, while in the rest no bacteriological examinations were made. Mannerstedt emphasizes the epidemiological importance of missed cases of pertussis in adults, which are very likely to occur owing to the usually mild course of the disease at this age. Although the data are not conclusive owing to the absence of the cough plate in the first attack, he maintains that second attacks of pertussis are more frequent than is generally supposed.

F. Tecilazio<sup>2</sup> describes the following *radiological appearances* in the different stages of pertussis. At the commencement of the paroxysmal stage the numerous small annular formations described by Pincherle are seen in the subclavian regions of both lungs and elongated figures with more or less thickened margins. The latter represent dilatations of the small and medium-sized

bronchi, while the annular formations represent tangential sections of the bronchi and possibly small areas of surrounding emphysema. At a later stage the basal triangle described by Göttsche due to endobronchitis, endobronchiolitis, and peribronchitis is seen. The radiological appearances thus faithfully reproduce the anatomical changes in whooping-cough.

M. Braschi,<sup>3</sup> in examination of 12 cases, found that sometimes *leucocytosis* might be slight or entirely absent in pertussis, and when it did exist was subject to wide variations quite independent of the stage of the disease. He concluded that leucocytosis in whooping-cough was mainly due to the toxic action of the causal organism rather than to the mechanical action of the violent cough.

The effect of *whooping-cough upon tuberculosis* is illustrated by G. J. Huet,<sup>4</sup> who recorded an epidemic of pertussis among tuberculous children in a sanatorium. X-ray examination showed that the tuberculous process was aggravated in 6, remained stationary in 3, and was improved in 10.

DIAGNOSIS.—I. Inaba and S. Inamori<sup>5</sup> maintain that in the diagnosis of pertussis it is better to depend upon the absolute number of lymphocytes than on the total leucocyte count and the percentage of lymphocytes, especially when complications are present.

PROGNOSIS.—According to the Epidemiological Report of the Health Section of the League of Nations,<sup>6</sup> whooping-cough may give rise to permanent physical and mental disorders, such as changes in the lung tissue and mediastinal lesions as revealed by X-rays, as well as nervous and vascular lesions, while the anxiety which precedes and accompanies the paroxysms may considerably disturb the emotional equilibrium of delicate children.

PROPHYLAXIS.—L. W. Sauer<sup>7</sup> has treated 650 non-immune infants and young children by a vaccine which differed from all other pertussis vaccines in being made every few months from recently isolated haemolytic strains of the Bordet-Gengou bacillus. The total dosage after six months of age was 8 c.c. Local and systemic reactions were insignificant. Thirty-two children used as controls in 25 of the families contracted undoubted pertussis, while 170 of the injected children in these families who had been exposed escaped.

M. Stallings and V. C. Nicholls<sup>8</sup> treated 18 patients aged from ten months to adult life with no previous history of pertussis and with intimate exposure to the disease by doses of 0.2, 0.4, 0.6, 0.8 and 1 c.c. of undenatured pertussis antigen every other day, the last dose being repeated, with the result that 11 showed no symptoms and 7 had an extremely mild attack of pertussis. Similarly good results in immunization against whooping-cough were obtained by J. M. Frawly<sup>9</sup> with injections of undenatured antigen of *H. pertussis* in a group of 505 non-immune school children.

TREATMENT.—M. Stallings and V. C. Nicholls<sup>8</sup> treated 232 patients aged from 7 weeks to 38 years in the catarrhal or paroxysmal stage of whooping-cough with *undenatured pertussis antigen* in doses ranging from 0.1 to 1 c.c. daily until the symptoms abated, with the following results. Abatement of the symptoms within a week or less took place in 78 per cent and within two weeks in 14 per cent, while in 8 per cent the symptoms persisted over a fortnight.

V. de Gironcoli,<sup>10</sup> after failure of vaccine therapy, treated 20 severe cases in children aged from 25 days to 30 months in the paroxysmal stage by one or two intragluteal injections of *maternal blood*, with the result that all but 3 showed rapid improvement.

REFERENCES.—<sup>1</sup>*Jour. of Pediat.* 1934, v, 576; <sup>2</sup>*Pediatrics*, 1934, xlii, 921; <sup>3</sup>*Ibid.* 1935, xliii, 396; <sup>4</sup>*Nederl. Tijds. v. Geneesk.* 1935, lxxviii, 2522; <sup>5</sup>*Amer. Jour. Dis. Child.* 1934, xlviii, 1193; <sup>6</sup>*Epid. Rep. Health Sect. League of Nat.* 1934, xiii, 109; <sup>7</sup>*Amer. Jour. Dis. Child.* 1935, xlix, 69; <sup>8</sup>*Ibid.* 1934, xlviii, 1183; <sup>9</sup>*Jour. Amer. Med. Assoc.* 1934, ciii, 960; <sup>10</sup>*Riv. di Clin. Ped.* 1934, xxxii, 69.

## WORMS, INTESTINAL, IN CHILDREN.

Reginald Miller, M.D., F.R.C.P.

The following is culled from an article by F. M. Allen.<sup>1</sup> The worms commonly found in the intestine of children of this country are : (1) Thread-worms (*Oxyuris vermicularis*) ; (2) Round-worms (*Ascaris lumbricoides*) ; (3) Tape-worms (*Tænia mediocanellata*, *Tænia solium*, and less commonly *Tænia cucumerina* and *Tænia nana*) ; (4) Flagellate-worms (*Lamblia intestinalis*), now suspected of being a cause of certain obscure types of diarrhœa ; and (5) Whip-worms (*Trichocephalus dispar*).

**Thread-worms.**—The *Oxyuris vermicularis*, in its infestations, occurs in large numbers in the intestine. Each worm resembles a small piece of thread. The female is longer than the male, and measures about half an inch. The ova hatch as they pass down the intestine after ingestion by the mouth, and reach maturity in the lower small bowel, where they produce large numbers of ova. Though the small intestine is their home of election many are passed in the feces. Some, however, migrate from the rectum, and may be found around the anus, especially in the dirty child whose perineum is soiled with excreta. Re-infection occurs readily in such a child, whose hands become soiled with excreta containing ova, which lodge under the nails and elsewhere. Original infection may be due to eating food which has been contaminated by flies carrying infected material, but also by toys, towels, handkerchiefs, and pencils which have been soiled by an infected child.

The most prominent symptom is itching of the anus, especially at night when the child is in bed. Itching leads through scratching to injury of the superficial tissues surrounding the anus, and to restlessness and sleeplessness. In girls the worms may migrate or be transferred to the vulva, and so set up a vulvo-vaginitis. The worms cause enuresis and frequency of micturition. Their presence draws the attention of the child to the perineal region and the genital organs, and masturbation may be initiated. Colicky pains may also be associated with the presence of thread-worms. Still has recorded that they are present in the appendix in a large proportion of autopsies, and the relation of appendicitis to their presence is unsettled.

**TREATMENT.**—In instituting treatment it is useful to explain briefly to the mother the mode of infection and especially the ease of re-infection. The first element of treatment is the destruction of worms by the use of *santonin combined with calomel*. Tablets containing  $\frac{1}{2}$  gr. of each are given on alternate nights until three or four have been taken. This is a suitable dosage for a child of five years. In conjunction with this the lower bowel should be irrigated with a pint of warm water containing a large teaspoonful of common salt. Afterwards, the child's perineum and anus having been thoroughly cleansed and dried, the anus should be anointed with an antiseptic mercurial ointment, such as 2½ per cent white precipitate, or blue ointment. If there is much excoriation of the skin anæsthesin powder (5 per cent) may be added. The child should sleep in a nightgown, which is sewn up at the bottom, or in pyjamas, to ensure that direct scratching of the anus is impossible. The child's nails should be kept very short lest ova find a concealed conveyance to the mouth, and the hands should be scrubbed before all meals. *Butolan* (Bayer) is a useful vermicide for oxyuris, and a child of six may take one tablet three times a day. This assists in destroying such worms as have already escaped and those which are in the upper intestine at the institution of treatment. Worms lodged in the appendix may be eradicated by butolan medication. Colonic lavage should be persisted in for six successive nights, and after an interval of one night should be resumed for six further nights. After an interval of one week, there should be a colon wash-out on three successive

nights, and if worms appear in any one of these, a further week's lavage should be undertaken.

**Round-worms.**—In appearance the round-worm (*Ascaris lumbricoides*) is like the common earth-worm. The female is larger than the male, and varies from 5 to 10 in. in length, being yellowish-white or reddish-yellow in colour. It is not solitary, and the passage of one worm usually means that there is at least one more present in the bowel, and perhaps more. The life history is not properly understood, but it is possible that the embryos develop outside the body and enter in the drinking-water.

The ascaris is reputed to be notorious for its migratory habits, and it is recorded that one has travelled up the œsophagus and down the trachea into the lung, where it has set up a lung abscess; it has been found impacted in the common bile-duct, and it has perforated the intestinal wall and caused a peritoneal abscess.

It is with ascaris and tœnia that the so-called symptoms of worms are likely to occur, but it seems to be just as likely that these symptoms are due to faulty diet and bad habits at meal times. Scepticism should not be expressed too forcefully, however, as it is possible that the presence of worms is merely one are of a vicious circle of chronic catarrh, chronic indigestion, improper diet, and bad dietary habits. Their presence may be suspected, and an eosinophilia will confirm the suspicion; but usually the passage of one or more worms is the first, and perhaps the only, indication of their presence.

**TREATMENT.**—*Santonin* is the anthelmintic of choice, and should be given combined with calomel, either as a powder or as a tablet :—

R	Santonini	gr. j		Sacch. Lact.	gr. iij
	Hydrarg. Subchlor.	gr. j			
				Fiat pulv.	
R	Santonini			Hydrarg. Subchlor. aa	gr. j
				Fiat tab.	

and followed by a saline in the morning, either a teaspoonful of magnesium sulphate or a Seidlitz powder, magnesium hydroxide, or an effervescent fruit salt. It is advisable to secure a preliminary purge with a saline and to institute a fluid diet for twenty-four hours preceding the treatment with santonin. The active principle of santonin is soluble in oil, so that castor oil is not advisable as a purgative at any time during treatment. Yellow vision and reddish urine may occur as a result of santonin administration, but are harmless. In the event of santonin being inapplicable for any reason, *oil of chenopodium* may be used, one drop being prescribed for each year of age, and being given in capsule form.

**Tape-worms.**—Tape-worm infestation is not common, but its occurrence is not to be regarded with equanimity, as the successful evacuation of the parasite is a matter of considerable difficulty. The commonest tape-worm in this country is *Tœnia mediocanellata (saginata)* derived from meat, although *T. solium* from pork also occurs. The incidence of *T. cucumerina* from the lice of dogs and cats and of *T. nana* (dwarf tape-worm) is low. The presence of the worm is easily recognized by the passage of masses of segments of the worm, and the distinction of the type of worm is made by noting the characteristic features of the arrangement of hooks and suckers on the head.

Parents recognize the unusual content of the stool (the passage of which will probably have alarmed the child) as a tape-worm, and it is then that any uncommon symptoms which the child may have exhibited during the previous months will be attributed to the worm. The mere presence of tape-worms in the intestine cannot account for wasting, although failure to gain weight will be attributed to it.

**TREATMENT.**—Extract of *male fern* has long been recognized as a lethal agent for tania, but its administration is not attended with universal success for several reasons. Extracts, to be effective, must be freshly prepared, and this is not always possible. Further, the extract is irritating to the stomach and is liable to be vomited. Administration by capsule is only possible with older children and impossible with many, adults included. Dispensing chemists have exercised their ingenuity in devising prescriptions to render the drug acceptable; the following has been used with success:—

R	Ext. Filicis	℥xxx		Syr. Aurant.	ad ʒss
	Ovi Vitell.	q.s.			

As the treatment may be ineffective for the reason that the stomach is intolerant of preparations of male fern, substitutes have consequently been sought. *Pelletierin tannate* has been used in doses of 2 gr. in powder, and *seeds of pomegranate* made into an infusion have been administered with partial success, but all of these, including male fern, require a three days' preliminary treatment with purgation and low diet, so that the bowel is clear of as much extraneous matter as would possibly interfere with the action of the poison on the worm. A substitute which deserves an extended trial is *tetrachlorethylene*, as it is easily tolerated by the stomach, is readily taken by the child, has not other effects, and does not necessitate three days' previous purgation. It is an oily substance, given in doses of 4 c.c. for an adult, a child of eight years accepting 2 c.c. readily. Administration is in a saturated solution of magnesium sulphate (1 to 2 oz.), by mouth, the oil being emulsified by repeatedly drawing it up into a serum syringe and ejecting it forcefully into the medicine glass. Signs of intoxication have been recorded in adults, but so far the author has not observed this in children. Six hours after administration a full dose of Epsom salts is given, and the whole worm is usually passed in a few hours. Preliminary purgation is not essential, but a saline may be given twenty-four hours previously, and a low fat diet should be taken during this time. Tetrachlorethylene is soluble in oils and fats, and for this reason castor oil should not be used as an aperient subsequently.

Alternatives are *filmaron*, which is a compound of filicin in castor oil and is given in doses of 2 to 4 drachms, and *thymol*, which may be prescribed in cachets to children who can swallow it, in doses of  $7\frac{1}{2}$  gr. (for a child of six years).

**Lambliæ or Giardia Intestinalis.**—Attention has been drawn to lambliasis on account of its association with some forms of intractable diarrhoea. *Lambliæ* is a flagellate organism which is conveyed by water contaminated by mice and rabbits, and has been associated with trench diarrhoea as experienced during the Great War. It is presumed that the population has a number of carriers of this organism, who are responsible ultimately for the spread of the infestation. Others regard the occurrence of *Lambliæ* in the stool as a secondary invader.

In children the stools are frequent and loose and contain undigested food and mucus. Peristalsis is increased so that there is insufficient time for proper absorption in the bowel, and the stool is pale from excess of fat (although this does not reach the figures found in cœliac disease). At first there may be considerable increase in the number of the stools, but this gradually decreases until the child is passing two, or perhaps three, in the twenty-four hours. There are no other symptoms.

**TREATMENT.**—This is difficult, as no known drug appears to be successful. Rest, colonic lavage, bland diet, are indicated when the diarrhoea is severe. Organic arsenicals have been tried, and stovarsol administered by mouth has

been vaunted. Colonic lavage with weak solutions of quinine have recently been reported successful. The importance of the affection is that its discovery may prove the solution of a condition which may be mistaken for tuberculosis or celiac disease.

**Whip-worms.**—Still records that, next to round-worms, the whip-worm (*Trichocephalus dispar*) is the commonest intestinal parasite in children, being present in 8 per cent of post-mortem examinations. The number of worms present is never very numerous, less than a dozen being found in a single case, and these usually associated with thread-worm infestation. In appearance the worm is white, the caudal end being thick and the remainder resembling a finely-drawn-out filament. The worm attaches itself firmly to the mucous membrane by the fine head which is buried in the tissues. The ova are characteristic in shape, being ovoids with a button-like projection at either end. They are sometimes encountered in routine examination of the stool.

There are not any symptoms directly attributable to the worm, although it is recorded that blood has been found in the parasite's alimentary tract. But the number of worms present is never sufficient to cause anemia of any degree of severity. It is conceivable that they may be implicated in diseases associated with injury to the intestinal mucous membrane, and with appendicitis.

**TREATMENT.**—The treatment is mainly the same as that of thread-worm infestation.

REFERENCE.—<sup>1</sup>*Practitioner*, 1935, cxxxiv, 502.

## WOUNDS AND WOUND INFECTIONS. (See also BURNS; SKIN GRAFTING.)

Sir W. I. de C. Wheeler, F.R.C.S.I.

**Principles of Treatment.**—Gradually orthodox conceptions as to the treatment of infected wounds are changing; there is, in fact, a revolution taking place; old ideas based entirely upon the Listerian ideas of infection and antiseptics are giving way to experimental work in other directions. Winnett Orr has proved the efficacy of the treatment of septic osteomyelitis by simply excising dead and infected tissues, cleaning the parts with spirit and iodine, packing the resultant cavity with vaseline gauze, and encasing the limb in plaster-of-Paris without any drainage for several weeks. The treatment of septic bone cavities by maggots was discussed in the MEDICAL ANNUAL for 1932 (p. 335) and 1933 (p. 321). Albee modified Orr's treatment, believing that bacteria produced a self-destroying substance called 'bacteriophage'. This substance, which brings about the destruction of the bacteria, can be isolated. Albee does not use gauze for packing the wound; he pours a mixture of vaseline and paraffin, 75 per cent of the latter and 25 per cent of the former, into the wound, where it consolidates. He introduces 10 c.c. of bacteriophage daily through a tube which is left *in situ* at the bottom of the cavity. In varicose ulcers the affected part is treated by nothing except its own discharge under a tight bandage of elastic strapping. The bandage is not changed as a rule until an interval of seven to fourteen days has elapsed.

Murphy many years ago, in his monthly publication known as the *Murphy Clinics of Chicago*, spoke of "defensive and protective" fluids or pus in the peritoneal cavity in cases of gastric or duodenal perforation and acute appendicitis, as distinct from the "offensive and destructive" pus which occurred late in neglected cases. Thus it would seem that a bacterial offensive is met by a corresponding defence locally produced by the same organisms in the tissues affected. The attempt to destroy bacterial invasion by local applications and frequent antiseptic dressings may defeat its object.

In the MEDICAL ANNUAL for 1935 (p. 169) mention was made of the treatment of septic fingers after incision by the application of a large lump of sterile vaseline kept in position by gauze wool and bandage. The dressing is not changed for a week. "At first sight the hand looks very dirty with a mixture of pus, blood, and vaseline; on cleaning, however, it is seen that the skin is soft and supple, and the wound edges are fresh and clean." The same dressing is applied once a week until healing is complete. This treatment contrasts favourably with treatment by antiseptics, stupes of hypertonic salt, etc., and results in a soft skin and a supple painless scar. It goes without saying that all treatment must be modified according to the presence or absence of temperature and pain.

The treatment of infection (e.g., osteomyelitis, burns, septic fingers, varicose ulcers, etc.) by closed methods has been referred to in previous numbers of the MEDICAL ANNUAL. The avoidance of dressings and the reliance on the defensive properties of the local reactions are becoming more generally accepted. It would appear as if surgery was passing from an era of antisepsis through asepsis back again into a firmer belief in the efficacy of nature's power for repair when allowed to function undisturbed.

J. J. Robb<sup>1</sup> states that he has little doubt about the benefit of the closed method of treating sepsis of bone, whether acute or chronic, and that it seems logical to extend the idea to the treatment of other septic conditions. Localization and defeat of the invading organisms, he says, proceed under high tissue tension both in and around the lesion. Not until the situation is safe does necrosis appear; pus evacuates, and repair begins. Robb points out that in a case of *acute osteomyelitis* pain is intense, but that if the limb is immobilized pain disappears even though the infection extends. He infers from this that the object of pain is to prevent voluntary movements which interfere with the processes of repair.

*Abscesses* should be opened, but there is an optimum moment for the incision, neither too soon nor too late. The incision should be adequate and drainage should be avoided. A drainage tube is no better than a slough, and must be got rid of by the tissues. If the opening is made through such a tissue as muscle closure may be expected, but if it is made through a route which would be chosen by nature no artificial means to maintain the opening is necessary. It seems wise to employ very simple forms of treatment to assist the processes of healing. Immobilization appears to be an important factor. Robb can see no use for any of the antiseptic forms of treatment. The ideal dressing for all forms of tissue sepsis is undoubtedly the adhesive elastic bandage.

Robb's treatment of *cellulitis* is as follows: "In dealing with cellulitis in the surgical out-patient department the bandage is applied so as to cover generously the part involved, and, where it concerns a limb, that part is always completely encircled with the bandage. If a lymphangitis is present the bandage is continued proximally to cover it. The relief of the patient from discomfort is very often almost immediate, and the general physical upset is speedily checked. In a bad case I may see the patient the next day, but with increasing confidence in this form of treatment I find it unnecessary in most cases to see him sooner than from four to seven days. He is warned, however, to report immediately should his general symptoms increase. At the end of four to seven days the splint or sling is removed and the limb is palpated through the bandage. If no pain is elicited and no fluctuation felt, he is merely asked to report again a week later, when the bandage is removed. Only if a local abscess has formed is surgery required, and quite often no such abscess forms. Frequently, with quite a severe initial cellulitis of the forearm, a man may return to work in four to seven days still wearing his bandage.



"As regards the use of the elastic adhesive bandage and the viscopaste bandage, I find very little to choose between them except that the viscopaste one can be twisted round areas, such as the clefts between fingers, where the elastic adhesive cannot comfortably be applied. The use of these bandages, though apparently costly, is not found to be so. Dressings are very greatly reduced in number, antiseptics are practically eliminated, and the staff consequently liberated for other duties."

Robb's communication brings to mind Hilton's classic on 'Rest and Pain', Baynton's treatment of ulcers by strapping in use half a century ago, and many of the diets laid down by our forefathers. Dry-cupping, bleeding, and various ancient remedies are again under review, and, as stated elsewhere, a quasi-revolution is taking place. The reviewer recommends beginners to study the old books before coming to the conclusion that anything modern is also new.

**Surgical Maggots in Suppurative Infections.**—This method of treatment has not found favour in Great Britain; the word 'maggot' is repulsive, and whatever the results of their employment neither the profession nor the public will favour the method until some more convincing reasons are forthcoming for the abandonment of orthodox measures. Wm. Robinson<sup>2</sup> summarizes a communication on the subject as follows:—

"The use of living maggots in the treatment of infected wounds involves certain problems of a biological, as well as a clinical nature. In this article a discussion is given of such questions as the inability of maggots to reach deep necrotic areas without surgical assistance; the unfavourable effect upon maggots of accumulated wound secretions; the implantation of maggots in the wound; the need of avoiding the use of excessive numbers of maggots in the wound; a description of various types of maggot retainers over the wound; removal of maggots; why they sometimes die in the wound; and why they sometimes escape from the wound."

**Cod-Liver Oil Salve in Treatment of Wounds.**—W. Loehr discusses the treatment of fresh injuries, burns, and phlegmonous inflammations with cod-liver oil salve, with and without plaster. If his reasoning is correct, halibut oil might be more efficacious. An abstract<sup>3</sup> of his paper is as follows:—

"Loehr has used raw cod-liver oil in the treatment of wounds of the most varied types over a period of three and a half years. This was possible because bacteriological studies proved that cod-liver oil is sterile, and further investigations showed that the organisms most frequently causing suppuration in wounds—streptococci, staphylococci, and colon bacilli—are soon destroyed when they are introduced into it. The chief purpose of these investigations was to determine whether it was possible to obtain a direct effect on wound tissues by cod-liver oil comparable to that obtained in the many conditions in which the administration of cod-liver oil by mouth gives excellent results. As the cod-liver oil is too fluid, it was mixed with sterile vaseline and applied to the wounds in the form of a paste.

"The very favourable effect of the cod-liver oil on wound healing is manifested by quick cleansing of the wound and rapid separation of all necrotic and necrobiotic tissue. As is true of all processes of wound healing, the explanation of this very evident excellent healing effect is difficult to explain. However, numerous investigators—among them Nordmann, Bisceglie, and Katzenstein—have found that vitamins exert a very favourable growth-stimulating influence on tissue cultures, and the pathologist Dietrich has demonstrated that the injection of vitamin D into the ears of rabbits leads to the formation of epithelial cysts and proliferations, a finding which was confirmed by Nordmann. A

direct influence of vitamins on wound tissues is thereby proved. Other investigators have demonstrated parenteral resorption and effectiveness of vitamins. Accordingly, it seems logical to assume that in the treatment of human wounds with cod-liver oil there is a vitamin action such as that which has been demonstrated in animals. Whether still other factors are active in such treatment has not yet been determined and is very difficult to prove.

"The cod-liver oil is applied directly to fresh wounds in the form of a salve with the aid of a plaster dressing. No drains or strips of gauze are used. The oil has proved especially effective in second- and third-degree burns. In the treatment of burns of the extremities it is used in combination with a plaster dressing, and in the treatment of burns of the trunk in the form of salve dressings. Its effect in stimulating epithelial growth is so extraordinarily great that in the three and a half years in which the author has used it transplantation has never been necessary.

"Of equal importance is the effect of the cod-liver oil on granulation tissue. The author cites illustrative cases of the most varied types—injuries of the fingers treated with cod-liver oil and a plaster dressing, gunshot injuries of the fingers, burns due to acids and hot water, searing injuries, complicated fractures, and defects left by phlegmons and gas gangrene."

**Acute Infections following Trivial Injuries to the Hand.**—S. L. Koch<sup>4</sup> deals with this important subject. He first refers to cases known variously as 'acute lymphangitis', 'acute spreading cellulitis', 'acute streptococcic septicaemia', and, by the laity as 'blood poisoning'. Such infections most often occur from trivial finger injury, infection of the lip, or the extraction of a septic tooth. The patients that survived have been those who were treated by conservative methods and in whom active surgical intervention was delayed until there was no question as to the presence of a definitely localized suppurative process. One group of cases demonstrated the fact that resolution takes place without complication or abscess formation even although such danger signals as the red lines of lymphatic infection are seen when the patient is admitted to hospital. No case in this group received antistreptococcic serum. Koch has no evidence that it is of value, but when given by others it did no harm. Another group is mentioned in which the question of recovery or a fatal issue was in the balance for many days. An axillary abscess usually formed, and when this was opened recovery rapidly followed. In this connection, Koch states that if by any mischance in incising an abscess one breaks through the limiting wall of leucocytes and fibroblasts the liberated infectious material finds ready access into the open lymphatics leading directly into the systemic circulation.

It is the part of wisdom to limit surgical procedures to the very minimum—a simple incision without retraction, without stretching the wound edges, and without digital exploration of the abscess cavity. In one case the abscess was allowed to rupture spontaneously, and in so doing, "we were giving the patient the greatest measure of safety". Koch's paper is lengthy, learned, and to the point. Of 22 cases which recovered, all were treated conservatively from the moment they were first seen, with rest in bed, massive warm wet sterile dressings over the entire upper extremity, and forced fluids. In none was the inflammatory process incised until there was absolute evidence of localization and abscess.

**Electrosurgical Aspirator.**—G. E. Ward<sup>5</sup> describes an instrument which aspirates blood from a surgical wound and at the same time will permit coagulation of bleeding points by touching the electrodes to the bleeding point, as the area is kept dry with the aspirator and the current turned on by means of a switch in the handle of the electrosurgical aspirator. This

greatly facilitates operating through normal tissue, such as abdominal or breast wounds, deep-seated wounds, operations in the urinary bladder, oral cavities, and brain.

**Superficial Wounds.**—J. E. Cannaday<sup>6</sup> deprecates the frequent dressings of granulating wounds. He advocates protection of the wounds with wire gauze, and their exposure to warm, dry air, from the sun or electric cradles. He says that wound dressings are not only economically wasteful, but delay and may prevent healing.

**Germ-proof Masks.**—J. Staige Davis<sup>7</sup> emphasizes the importance of adequate masking during operation. He gives some convincing data in proof of the potential dangers which exist if the nose and mouth are not covered with some germ-proof mask.

**Sterility of Catgut.**—R. O. Clock<sup>8</sup> throws grave doubt on the sterility of catgut treated by chemical means: 62.5 per cent of brands of foreign catgut sutures were found to be non-sterile. Carefully controlled heat sterilization is the only uniformly reliable and positive method of sterilizing surgical catgut sutures.

**Bed-sores.**—T. J. Carty<sup>9</sup> recommends the application of *elastic adhesive plaster* for the treatment of bed-sores. He believes, like others, that the retained discharge has considerable proteolytic powers, and that it helps to liquefy the necrosed tissues on the base and edges of the ulcer. He writes as follows:—

“Two pieces of elastic adhesive plaster, one over the other, are applied so that the bed-sore and the skin surrounding it for at least an inch are covered. If the bed-sore has a greater diameter than the elastoplast bandage two pieces may be laid side by side and held together by two other pieces placed at right angles. The elastoplast is left in position as long as it will adhere—usually, in the early stages when discharge is plentiful, twelve to forty-eight hours. It is then replaced by similar pieces of adhesive plaster, and this is repeated until healing is complete. On removal of the bandage no attempt should be made to clean the surface of the sore; it suffices to wipe away the discharge from the surrounding skin with cotton-wool or soft cloth before applying a new piece of bandage.

“Ordinary non-elastic adhesive plaster was not tried because it cannot be applied accurately to rounded or irregular surfaces—for example, the elbow, heel, shoulder-blade. Its edges are sharp, and it wrinkles unless the part is immobilized. The following objects are served by the use of two-layered plaster: (a) The discharge does not readily soak through; (b) The two layers, plus the discharge over the ulcer, serve as an effective cushion, protecting the granulations by distributing pressure; (c) Where incontinence of urine or faeces is present the ulcer surface is less readily contaminated from this source.

“Itching under the bandage is usually complained of, and much attention is required to keep the patient from scratching the bandage off. In my experience itching has never been so pronounced as to demand cessation of this form of treatment.

“Ten cases of bed-sore were successfully treated by the application of elastoplast dressing. Fifteen days was the longest time taken for healing, and no case proved intractable. No systemic reaction, due to retention of discharge about the ulcer, was observed. The application of elastoplast in two layers is advised.”

REFERENCES.—<sup>1</sup>*Brit. Med. Jour.* 1935, i, March 9, 466; <sup>2</sup>*Amer. Jour. Surg.* 1934, xxv, Sept., 525; <sup>3</sup>*Surg. Gynecol. and Obst.* 1934, lix, Dec., 522; <sup>4</sup>*Ibid.* Sept., 277; <sup>5</sup>*Amer. Jour. Surg.* 1934, Aug., 353; <sup>6</sup>*Ibid.* 288; <sup>7</sup>*Ann. of Surg.* 1934, Nov., 1008; <sup>8</sup>*Surg. Gynecol. and Obst.* 1934, Dec., 899; <sup>9</sup>*Brit. Med. Jour.* 1935, i, 105.

**X-RAY DIAGNOSIS.** (See also LUNG, RADIOGRAPHY OF; WHOOPING-COUGH; ETC., ETC.) James F. Brailsford, M.D., M.R.C.S.

### THE SKULL.

**Thorotrast Injection of Ventricles.**—E. W. Twining and G. F. Rowbotham<sup>1</sup> have investigated the method of ventriculography by opaque injection and recorded their findings in a paper under this heading. The ventriculograms in *Plate LXXIII* were obtained by the following method. With the patient lying on the left side 25 c.c. of fluid was withdrawn from the right ventricle and 10 c.c. of air was introduced followed by 10 c.c. of thorotrast. The thorotrast was poured into the funnel used for the reception of the cerebrospinal fluid and mixed with it by agitation. It was run into the ventricles by raising the funnel. Radiographs are made within fifteen minutes.

The reviewer<sup>2</sup> has published a radiograph showing that the thorotrast is picked up in the lining cells of the ventricles, where it is retained for a very long time. Radiographs taken six months after showed thorotrast lining the ventricular system with apparently equal density. In view of the slight radioactivity of this thorium salt it would perhaps be unwise to apply this method until the possibilities of this retention have been thoroughly explored.

**Intracranial Tumours.**—H. K. Pancoast<sup>3</sup> has taken advantage of the fact that localized erosion of bone often indicates the presence of a tumour in the neighbourhood and has published a paper in which he indicates the significance of erosion of the optic canals in the study of intracranial tumours. K. Kornblum and L. H. Osmond<sup>4</sup> have critically analysed the X-ray appearances in a series of 74 verified intrasellar tumours, and state that definite deformity of the sella turcica occurred in every instance.

**Basilar Impression.**—B. Ebenius<sup>5</sup> has recorded the details of four cases in which the radiographs showed evidence of the so-called basilar impression. In this condition the volume of the posterior fossa of the skull is reduced by the upward thrust of the spine on the softened base. The following symptoms were noted: (1) Symptoms of cerebellar disturbance; (2) Symptoms from the medulla oblongata due to its compression by the odontoid process; (3) Symptoms of irritation and paralysis of the cerebral nerves in the posterior fossa of the skull and the uppermost spinal nerves; (4) General increase in the intracranial pressure. The lesion is indicated by slowly progressive symptoms, and apparently only relieved by decompression. It may occur as a complication in any condition which causes softening of the base.

**Cysticercosis.**—H. B. F. Dixon and D. W. Smithers,<sup>6</sup> in a paper on epilepsy in cysticercosis, and S. S. Allen and H. W. Lovell,<sup>7</sup> in a paper on cysticercus of the brain, have again drawn attention to the significance of the presence of the cystic stage of *Tænia solium*. It was shown by the reviewer (see *MEDICAL ANNUAL*, 1927, p. 532) that this parasite could be demonstrated by radiography if calcium had been deposited within the cyst. Unfortunately this may not occur for several years after infestation, and, as intracranial cysts rarely undergo calcification, such localization by radiography is not often helpful. The radiographic demonstration of parasites in the musculature, however, may serve to suggest the nature of the cerebral lesion.

### THE HEART.

**Kymography.**—Amongst the most interesting papers on radiology which have been published during the year are those by P. Stumpf<sup>8</sup> and I. S. Kirsch.<sup>9</sup> The graphic method of recording movements—kymography—permits a study of the size, shape, and movements of the heart and large vessels in diastole

# PLATE LXXIII

## THOROTRAST INJECTION OF THE VENTRICLES OF THE BRAIN

(E. W. TWINING)



Fig. A.—A case of metastatic tumour in the optic thalamus causing filling defect in posterior end of third ventricle.

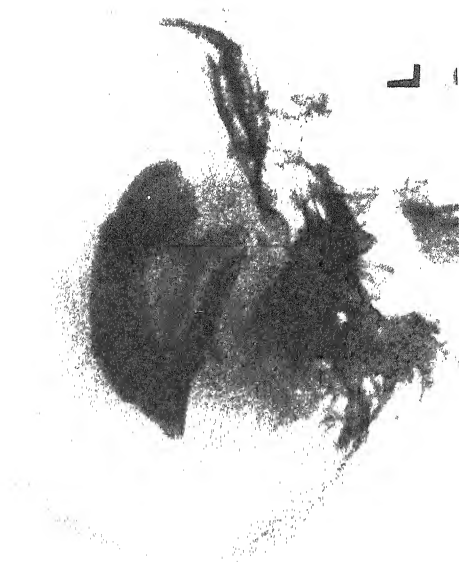


Fig. B.—Thorotrast lateral ventriculogram from a case of right acoustic neuroma. Normal lateral ventricles and third ventricle.

*PLATE LXXIV*

INTRAVENOUS PYELOGRAPHY DURING PREGNANCY

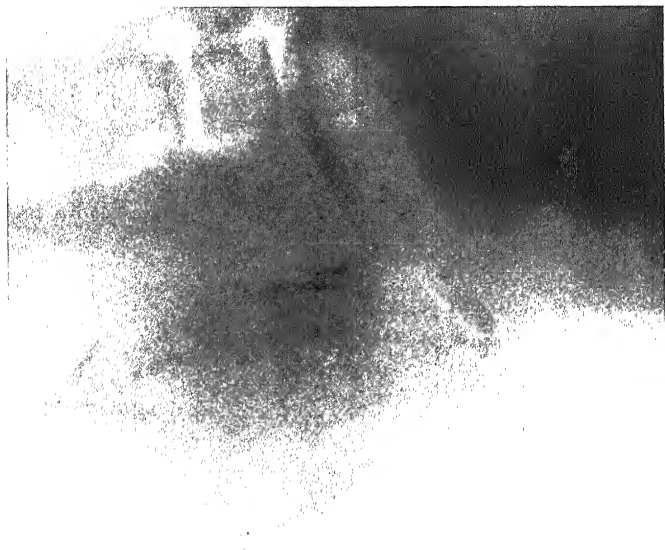
(JAMES F. BRAITSFORD)



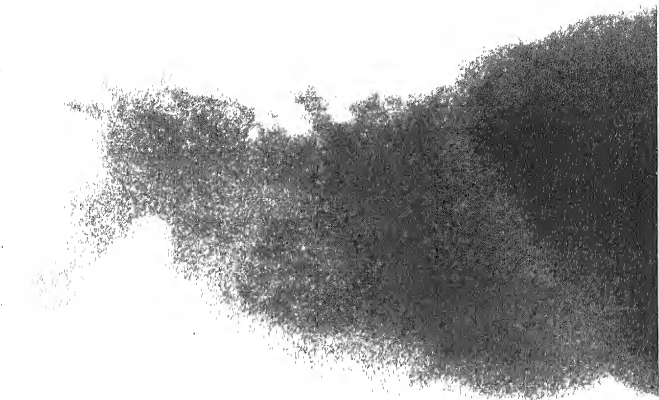
Note the mild degree of dilatation of the kidney, pelvis, calicets, and ureter on the left side, the rounded calcareous gland on the right, and the pressure deformity of the maternal bladder produced by the presceting fetal head.

PLATE LXXV—ANTE-NATAL RADIOGRAPHY

(JAMES F. BRAILSFORD)



*Fig. A.*—Lateral radiograph showing an anencephalic fetus in the uterus.



*Fig. B.*—Lateral radiograph showing a markedly deformed fetus in the uterus.

*PLATE LXXVI*  
**TRAUMATIC OSTEOPOROSIS**  
(JAMES F. BRAILSFORD)



*Fig. A.*—Radiograph of the hand of a man aged 50 years (March 1, 1935) four weeks after injury, showing subarticular osteoporosis of the carpal bones and bases of metacarpals.



*Fig. B.*—Radiograph of the hand of case shown in *Fig. A* (April 26, 1935), showing marked increase in the osteoporosis, particularly in the cancellous tissue. Note the irregular circumscribed areas of severe decalcification.



*Fig. C.*—Radiograph of the hand of case shown in *Figs. A* and *B* (Oct. 17, 1935), showing evidence of re-calcification.



and systole. Instead of using the single slit which was employed by the earlier workers in this field, a diaphragm with multiple slits is used, and this records the heart's movements at many points, the slits being but 12 mm. apart. It is claimed that by using the method it is possible to distinguish the shadows of the extrinsic from those of the intrinsic lesions of the heart and large vessels, and that certain areas of degeneration of the myocardium are indicated which may not be recorded by the electrocardiograph.

**Cardiac Mensuration.**—F. G. Wood<sup>10</sup> describes a method of comparative measurement of the heart in relation to the size of the chest from single films taken at a tube film distance of six feet. He shows that all the movements increase uniformly in relation to the surface area of the chest as seen in the radiogram. The diameters in the erect position are less than in the prone.

P. Natvig<sup>11</sup> demonstrates by radiographs the increase in the volume of the heart during inspiration with closed glottis (Muller's test), and diminution of the volume during forced expiration with closed glottis (Valsalva's test).

**Calcification of the Valves.**—P. A. Bishop and H. Roesler<sup>12</sup> give the details of the clinical signs, radiographic appearances, and post-mortem appearances of three patients whose radiographs indicated calcification of the cardiac valves, and discuss the X-ray diagnosis of intracranial calcification.

J. V. Sparks and C. Evans<sup>13</sup> publish details of a case in which radiographs show calcification of the cardiac valves.

**Coarctation of the Aorta.**—A review of the recorded radiographic appearances in coarctation or congenital stenosis of the aorta is given by E. F. Taylor.<sup>14</sup> The appearances referred to are: (1) Hypertrophy of the left ventricle; (2) Dilatation of the first part of the aorta; (3) Absence of the aortic convexity to the left of the dorsal spine; (4) The pencilled outline of the bifurcation of the trachea; and (5) Erosion of the borders of the ribs by the dilated intercostal and anastomosing vessels.

## THE CHEST.

**Chest Injuries.**—No more remarkable stereoscopic radiograph of the chest than that in the short communication by A. Campbell<sup>15</sup> has been published. It shows a motor-car door handle lying in the pleural cavity. The patient, a boy aged 13 years, had a motor accident. He sustained a lacerated wound over the right upper chest which was sutured and healed by first intention. He ran an intermittent pyrexia so was sent for X-ray examination on the tenth day to determine whether there was a fractured rib and for possible injury to lung, and the radiograph revealed the door handle. The case illustrates the importance of X-ray examination of lacerated wounds inflicted by motor-car and machine accidents.

**Intrathoracic Lymphogranuloma and Lymphosarcoma.**—E. R. Williams<sup>16</sup> has published his findings in a radiological study of twenty cases of intrathoracic lymphogranuloma and six cases of lymphosarcoma. His work supports previous observations that Hodgkin's disease has an earlier age incidence than lymphosarcoma. The palliative benefit of X-radiation is most noticeable, but prolongation of life is not so readily determined. The longest survival was that of a woman of 52 years who received radiation from 1922-33. The chief radiographic characters are discussed. Certain uncommon features were observed—namely, cesophageal involvement, lobar collapse, and phrenic paralysis.

**Bronchiectasis.**—P. Kerley<sup>17</sup> has given us an interesting and critical review of the recent work on bronchiectasis and the theories of its causation.

He shows that radiography reveals two distinct forms: (1) A cylindrical form associated with bulbous dilatation of the distal bronchi and thickening of the bronchial walls; and (2) A saccular form which even when first detected is saccular, but there is no dilatation of the larger bronchi and the walls are thin and atrophic. These two forms do not appear to be related and there is no tendency for them to merge or develop together in one individual. The saccular form, he suggests, results from developmental errors, while the cylindrical is acquired and due largely to disturbance of the pulmonary innervation, either vagal inhibition or sympathetic stimulation. He suggests that, like asthma, it should take its place among the allergic diseases.

**Silicosis.**—In a paper on silicosis in porcelain workers, P. F. Møller<sup>18</sup> reviews the radiographic findings in 798 workers: 361 were found to have silicosis. He mentions spontaneous pneumothorax and hypertrophy of the heart as signs, and that emphysema is frequent but tuberculosis comparatively rare. The silicosis is slowly progressive, of the peribronchial perivascular nodular type, with a tendency to early interstitial changes. It leads, he states, to 100 per cent of the workers having silicosis in a severe degree after 50 years.

### THE ALIMENTARY CANAL.

**The Acute Abdomen.**—In the MEDICAL ANNUAL 1935 (p. 486) the reviewer pointed out the importance of a radiological examination of patients suffering with so-called acute abdomen. That such an examination should be an essential part of the investigation of these cases is stressed again, for by it patients' lives will be saved and surgeons relieved of considerable responsibility. In these days of efficient portable X-ray apparatus the excuse that the patient will be subjected to unnecessary mauling is no longer tenable, as radiographs can be taken with the apparatus at the bedside with perhaps even less discomfort to the patient than he experiences during a clinical examination. Such radiographs can reveal, amongst other conditions, free gas in the peritoneal cavity, isolated loops of distended bowel, and pneumonic consolidation of the lung, before such can be detected on clinical examination. One has but to think of the cases with pleural pain associated with the basal pneumonias of childhood (which has been referred to the abdomen and been the cause of a peritoneal exploration or even death), to appreciate the value of a radiograph which reveals evidence of pneumonia and so checks the hand of the surgeon. Or again, one may think of the fate of patients who have been operated upon because their signs and symptoms suggested an acute abdomen though they were really due to coronary disease. Had such patients been X-rayed and the negative findings led to electrocardiographic confirmation, patient and surgeon would have been well saved.

I. W. Ponemon,<sup>19</sup> in a paper on the value of X rays in the diagnosis of the acute abdomen, cites a number of cases in which the X-ray gave the definite indication for or against operative interference.

**The Chronic Abdomen.**—As distinct from the former class, these are the patients who complain of vague abdominal pain and a loss of the sense of well-being. On clinical examination no evidence of disease may be detected. In such patients a radiographic examination may reveal definite signs of a lesion: these signs must not be ignored because of the lack of support from the clinical examination. Radiographic evidence of malignant disease has been detected by the writer six months before the clinical examination has yielded sufficient supporting evidence to convince the surgeon.

H. H. Berg,<sup>20</sup> in the Sylvanus Thompson Memorial Lecture on Clinical Radiology of the Digestive Mucosa, states: "The smallest carcinoma of the

stomach I have seen was the size of a thumb-nail. Nobody believed me when I said it was a carcinoma, but six months later, when it was removed, it was the size of a goose's egg. The patient died a year later." In this paper the author indicates the importance of investigating the mucous folds of the alimentary canal for the detection of small lesions, and claims that œsophageal varices can be so detected long before any clinical evidence of cirrhosis of the liver is forthcoming.

B. R. Kirklin,<sup>21</sup> in a paper on some problems in diagnosis and their solution by radiologic examination of the alimentary canal, suggests that the following signals should call for X-ray investigation: (1) Hæmorrhage from the alimentary canal; (2) Anæmia; (3) Marked and rapid loss of weight; (4) Repeated attacks of nausea and vomiting; (5) Persistent abdominal pain or recurring epigastric pain or distress related to food; (6) Constipation associated with abdominal pain, constipation alternating with diarrhœa; (7) Vague atypical symptoms for which no definite cause can be found. He cites examples under all the above headings with the clinical history and radiographic findings.

**Peptic Ulcer of the Œsophagus.**—A. E. Connolly<sup>22</sup> records the details of a case with radiographs showing an ulcer crater and spasm of the lower third of the œsophagus which was confirmed at a subsequent post-mortem examination.

**Post-operative Conditions.**—An interesting and instructive paper, with radiographic illustrations of the appearances and pathological conditions developing subsequent to the various surgical operations on the stomach and duodenum, has been published by S. C. Shanks.<sup>23</sup> He discusses the wide variety of appearances which may present themselves in the absence of any pathological condition and points out the difficulties in disentangling these normal variations from the pathological.

**Diverticula.**—The radiographic demonstration of a Meckel's diverticulum was made by G. E. Pfahler<sup>24</sup> and his findings were confirmed at operation. He gives an account of the radiographic appearances and clinical signs. Ross Golden,<sup>25</sup> in a paper on diverticulosis, diverticulitis, and carcinoma of the colon, sets forth the distinctive radiographic and clinical features of these lesions.

**Appendix.**—The roentgenological diagnosis of the diseased appendix is reviewed by A. Orley.<sup>26</sup> He discusses the significance of length, mobility, tenderness, filling, and stasis of the organ.

**Ileum.**—J. L. Kantor<sup>27</sup> draws attention to a non-specific ulcerative granulomatous inflammation of the terminal ileum in a paper in which he cites six cases. He states that the chief roentgen signs affect the colon and the terminal ileum, those in the colon possibly being reflex in nature. The chief changes in the ileum seen on X-ray are: (1) Filling defect just proximal to the cæcum; (2) Abnormality in contour of the last filled loop of ileum; (3) Dilatation of the iliac loops just proximal to the lesion; (4) A 'string sign' representing the actual lesion.

**Gall-bladder.**—W. H. Dickson<sup>28</sup> has given us an excellent survey of the possibilities of X-ray investigation of the upper right quadrant. He describes the technique adopted and illustrates many of the lesions which may be detected, and explains the significance of certain radiographic appearances.

B. R. Kirklin's<sup>29</sup> paper on cholecystography gives the technique used at the Mayo Clinic for this examination. He states that at the Clinic reports are made in three forms: (1) Normally functioning gall-bladder; (2) Non-functioning gall-bladder; (3) Poorly functioning gall-bladder. Evidence of gall-stones may be associated with any of the three. His radiographs of

tumours of the gall-bladder are very instructive and illustrate the great value of this test in the hands of the skilled radiologist. His findings are based on the examination of 60,000 patients, and he records that, using the test, 95 per cent of the X-ray reports were accurate.

A general review of the work done in the radiology of the gall-bladder is contributed by H. Graham Hodgson.<sup>30</sup>

### PYELOGRAPHY.

There is no method more valuable for the investigation of obscure pathology of the urinary tract than intravenous pyelography. It rivals cholecystography as a physiological test which indicates normal and pathological changes of the gross anatomical structure. It does not necessitate hospitalization of the patient. The test can be carried out with but slight discomfort to the patient within little more than an hour, and there are few surgical lesions of the urinary tract which it will not indicate before any other test or localizing physical sign.

In a paper on ante-natal radiology the reviewer<sup>31</sup> indicates the uses of intravenous pyelography not only for visualizing the shape, size, and position of the renal pelvis, calices, and ureters during pregnancy, but also for assisting in the diagnosis of placenta prævia. Following intravenous injection of uroselectan or oral administration of hippuran, the outline of the urinary bladder can be visualized by X rays (*Plate LXXIV*). In cases of placenta prævia the radiographs show the placenta occupying the space between the crescentic deformity of the bladder and the presenting foetal part. This method of investigation may yield considerable assistance to the obstetrician in the treatment of his patient.

H. Morris<sup>32</sup> has pointed out that the oral method is applicable in those patients in whom intravenous injections are contra-indicated, but that it is not so reliable as the intravenous method owing to individual differences in absorption of the hippuran.

The value of intravenous pyelography as a method of investigating such conditions as painless hæmaturia, renal calculus, renal tuberculosis, pyelitis, pyelonephrosis, and neoplasm is described in a paper on excretive urography by I. B. Barclay and J. B. Baird.<sup>33</sup>

### ANTE-NATAL RADIOGRAPHY.

The obstetrician can obtain by this method of investigation information concerning: (1) The nature of deformities in the shape and size of the pelvis, whether due to congenital defects, osseous dystrophies, deficiency disease, endocrine dysfunction, localized bone disease, trauma, remote skeletal disease, or impaction of the foetal head. (2) The size of the maternal pelvis with an error of no more than  $\frac{1}{8}$  in. These measurements can be obtained without disturbing or causing discomfort to the most sensitive patient. (3) The presentation of the foetus, the position of its limbs, and the size of its head. (4) Abnormalities of the foetus, multiple pregnancy, deformity (*Plate LXXV*), or death. (5) Placenta prævia. (6) The condition of the urinary tract, i.e., degree of dilatation of the renal calices, pelvis, and ureters (*Plate LXXIV*). The more important indications of this method of investigation are given by the reviewer.<sup>31</sup>

S. H. Clifford<sup>34</sup> describes a stereoscopic method of triangulation which he has applied to the X-ray measurement of the foetal head diameter in utero and for which he claims a high degree of accuracy, i.e., 97 per cent correct

to within 0.3 cm. and 99 per cent correct to within 0.5 cm. In a further paper<sup>35</sup> he publishes a graph which has been prepared from the study of 479 infants; from this graph he claims that it is possible to estimate the weight and age of the foetus in utero from the stereo-roentgenometric determination of the occipito-frontal diameter of the foetus. Data have been presented which suggest that the foetus gains in weight in utero at the rate of 5 to 6 oz. per week during the seventh and eighth lunar months, and at the rate of 8 to 12 oz. per week during the last two months of pregnancy.

G. W. Gustafson<sup>36</sup> stresses the importance of ante-natal radiography in a paper on the intra-uterine diagnosis of monstrosities. With his conclusion "that every condition calling for Caesarean section should be X-rayed and especially so in cases of placenta previa", most obstetricians who have experienced the value of the method will readily agree.

K. Overgaard,<sup>37</sup> in a paper on Otto's disease and other forms of protrusio acetabuli, has reviewed the literature, and points out that the deformity is most prevalent among women, and that a highly developed protrusion may mean a serious complication at a birth.

### BONES AND JOINTS.

**Traumatic Osteoporosis.**—Following trauma, particularly in the neighbourhood of the multi-articular joints of the wrist and foot, but also in the neighbourhood of the larger joints such as the knee and shoulder, a sequence of symptoms develops in some patients which may give rise to the diagnosis of tumour or tuberculosis. The trauma may in itself not occasion any great pain or disability: even that which is present soon after the injury may gradually disappear. Following a period of quiescence, in the affected part or in the extremity distal to the injury a painful and disabling condition may develop which is not relieved by rest and often resists all electro-medical applications. The affected part appears turgid, its skin thin, shiny, and red or bluish, and often moist. Movement of the part is painful. Serial radiographs taken during the development of the condition reveal a progressive decalcification of the cancellous tissue, at first as small circumscribed foci in the cancellous extremities of long bones, or in the short tarsal or carpal bones. The compact tissue of the shaft may appear to be very contrasty against the decalcified extremities, but ultimately this may show a progressive decalcification, at first rather irregular in its distribution, giving the bone a mottled appearance. (*Plate LXXVI.*)

The condition, which was first described by Sudeck, is often referred to as 'acute bone atrophy', a name which unfortunately does not readily occur to observers of this type of lesion, for it may last a number of years. As the condition develops in but a small proportion of patients who have suffered traumata, some other factor such as focal sepsis and intoxication may be the sensitizing agent. Treatments of different kinds have been applied. Turner claimed good results following injections of iodine. D. S. Middleton and J. Bruce<sup>38</sup> used acetylcholine.

R. Fontaine and L. G. Hermann<sup>39</sup> point out that *sympathectomy* has added greatly to the comfort of the patient as well as having brought about the restoration of function much quicker than could possibly have taken place without the operation. However, in cases in which there is an advanced stage of the disease, the *sympathectomy* frequently gives only partial relief of the pain and little or no improvement in functional disturbance.

F. B. Gurd<sup>40</sup> considers that the condition is not recognized by surgeons to the extent which its importance warrants, and this may result, on the one

hand, in accusing innocent persons of malignancy, and, on the other hand, a small number of surgeons prove their unfamiliarity with the condition by recommending too heroic measures, e.g., amputation.

The reviewer has described the radiographic appearances of lesions simulating tuberculosis and tumour,<sup>41</sup> and in a further paper<sup>42</sup> has given an account of the serial radiographic appearances throughout the development and healing of sites of osteochondritis, and indicated how these may be used in the control of treatment.

**March Fracture (Plate LXXVII).**—H. Dodd<sup>43</sup> has cited a case of fracture of the second metatarsal, the radiographic appearances of which were interpreted as those of sarcoma and led to amputation. This error with like grave consequences has occurred several times before, as indicated by the reviewer.<sup>2</sup>

**Kyphosis.**—In an interesting paper on adolescent kyphosis, J. M. Edelstein<sup>44</sup> discusses the etiology of this deformity. It appears most commonly in boys between the ages of 12 and 17 years, and it is usually during this age period that the vertebral epiphyses appear. Scheuermann, who first described the condition, considers that ossification is affected by a severe trauma or multiple small traumata. The deformity of the affected vertebral bodies slowly progresses and a marked permanent kyphosis results which is associated with the radiographic appearance of wedge-shaped vertebral bodies with or without Schmorl's nodes (herniations of the nucleus pulposus into the vertebral bodies) and marked diminution of the intervertebral space suggesting degeneration of the discs. That the lesion may be associated with very early appearance of the vertebral epiphyses is illustrated by *Plate LXXVIII*.

**Skeletal Dystrophies.**—In his Hunterian Lecture the reviewer<sup>45</sup> has classified the dystrophies of the skeleton on their serial radiographic appearances, typical illustrations of which are given in *Plates LXXIX–LXXXI*.

**Chondroma of the Intervertebral Discs.**—B. J. Alpers<sup>46</sup> has recorded the clinical and radiological findings occasioned by these cartilaginous extensions of the intervertebral cartilages into the spinal canal. He states that they are usually to one or other side of the mid-line, usually the left, firmly anchored to the disc, and causing pressure on the anterior aspect of the cord. They have been found in the lumbar and cervical regions. They appear to be related to trauma. The symptoms are slowly progressive and recovery follows removal. No indication may be given on the straight X-ray, but following lipiodol injection an obstruction will be indicated by the hold-up of the opaque injection. (*See also SPINE AND SPINAL CORD, SURGERY OF—HERNIATION OF NUCLEUS PULPOSUS.*)

#### MISCELLANEOUS.

**Peripheral Nerve Radiology.**—An interesting paper dealing with the demonstration of the peripheral nerves and their pathological changes in injury and tumour has been published by Makato Saito.<sup>47</sup> The sheath of the nerve is slowly injected with 0.5 to 1 c.c. of thorotrast and radiographs are taken twenty-four hours, two days, and three days afterwards. The injection flows centrally. The fibrous structure of the nerve is visualized, also the internal and external sheaths of the nerve for 10 to 17 cm. of their length. The author demonstrated that by this means the size and connections of neuromata can be visualized, and so far no injury has resulted from the injection.

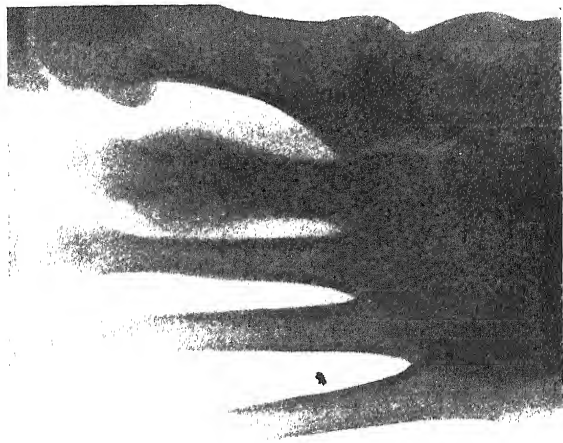
**Laryngeal and Hypopharyngeal Tumours.**—Borge Worning<sup>48</sup> records the results of X-ray investigation of fifty cases at the Finsen Institute. The results agreed in almost every particular with those obtained by laryngoscopy.

# PLATE LXXVII—MARCH FRACTURE

(JAMES F. BRAILSFORD)



*Fig. A.*—Radiograph of a foot showing ossification of a periosteal hematoma with a fracture through the shaft of the second metatarsal.

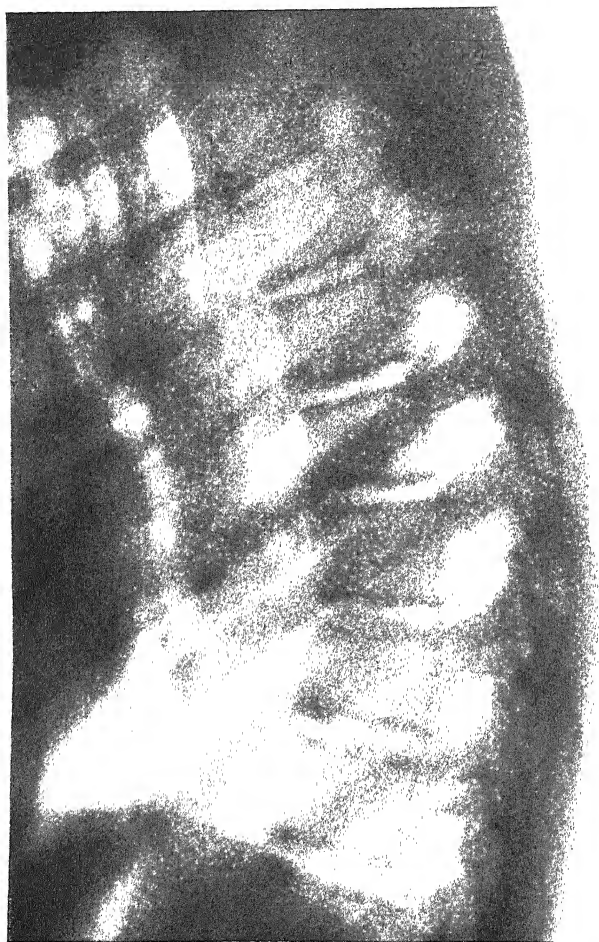


*Fig. B.*—Radiograph of same bone as *Fig. A* ten weeks later, showing mature cancellous bone and remodeling.

*PLATE LXXVIII*

INFANTILE KYPHOSIS

(JAMES F. BRAILSFORD)



Radiograph of the dorsal spine of a girl, aged 4 years, showing epiphyses on the superior and inferior borders of the vertebral bodies. There is deformity of the inferior border of the 8th and the superior border of the 9th dorsal vertebra. Early case of kyphosis with bony deformity.



*PLATE LXXIX*

MULTIPLE CHONDROMATA



Photograph of a youth affected with multiple chondromata which have produced hideous deformities of the hands and feet.

*Royal College of Surgeons Museum, No. 2157.2.*

*PLATE LXXX*

MULTIPLE CHONDROMATA---*continued*



Radiograph of the hands of C. W., aged 6 years, showing multiple chondromata (Ollier's disease). Early stage.

*PLATE LXXXI*

MULTIPLE CHONDROMATA—*continued*

(JAMES P. BRAILSFORD)



Radiograph of the hand of an adult, showing extensive development of multiple chondromata. *Late stage.*



Neither of the methods gives by itself sufficient information, but the two supplement each other fully. The radiograph shows: (1) Limit of the tumour's extent in downward direction; (2) Extent of its growth into the region back of the larynx and its recurrences there; (3) The destruction of the laryngeal cartilages. Tumours are manifested by: (1) Projections into the lumen of the air-passages; (2) Dislocation of the larynx; (3) Destruction of the cartilage.

REFERENCES.—<sup>1</sup>*Lancet*, 1935, ii, July 20, 122; <sup>2</sup>*Radiology of Bones and Joints*, J. and A. Churchill; <sup>3</sup>*Ann. of Surg.* 1935, Jan., 246; <sup>4</sup>*Ibid.* 201; <sup>5</sup>*Acta Radiol.* 1934, xv, 652; <sup>6</sup>*Quart. Jour. Med.* 1934, xxvii, 603; <sup>7</sup>*Ann. of Surg.* 1933, xcvii, 1; <sup>8</sup>*Brit. Jour. Radiol.* 1934, vii, Dec., 707; <sup>9</sup>*Ibid.* 728; <sup>10</sup>*Lancet*, 1935, i, May 25, 1210; <sup>11</sup>*Acta Radiol.* 1934, xv, 657; <sup>12</sup>*Amer. Jour. of Roent. and Rad. Ther.* 1934, Jan., xxxi, 1; <sup>13</sup>*Brit. Jour. Radiol.* 1934, vii, Aug., 463; <sup>14</sup>*Ibid.* 452; <sup>15</sup>*Ibid.* 1935, viii, March, 196; <sup>16</sup>*Ibid.* May, 265; <sup>17</sup>*Ibid.* 1934, vii, Sept., 531; <sup>18</sup>*Acta Radiol.* 1934, xv, 587; <sup>19</sup>*Amer. Jour. Surg.* 1935, xxviii, 122; <sup>20</sup>*Brit. Jour. Radiol.* 1935, vii, March, 137; <sup>21</sup>*Proc. Roy. Soc. Med.* 1935, xxviii, March, 549; <sup>22</sup>*Brit. Jour. Radiol.* 1934, vii, Dec., 764; <sup>23</sup>*Brit. Med. Jour.* 1934, ii, Dec. 8, 1032; <sup>24</sup>*Surg. Gynecol. and Obst.* 1934, Dec., 929; <sup>25</sup>*New Eng. Jour. Med.* 1934, Oct. 4, 614; <sup>26</sup>*Brit. Jour. Radiol.* 1935, Aug., 487; <sup>27</sup>*Jour. Amer. Med. Assoc.* 1934, Dec., 2016; <sup>28</sup>*Brit. Jour. Surg.* 1934, July, 69; <sup>29</sup>*Brit. Jour. Radiol.* 1935, viii, March, 170; <sup>30</sup>*Proc. Roy. Soc. Med.* 1934, Sept., 1473; <sup>31</sup>*Birmingham Med. Rev.* 1935, June, 82; <sup>32</sup>*Brit. Jour. Radiol.* 1935, June, 393; <sup>33</sup>*Ibid.* April, 201; <sup>34</sup>*Surg. Gynecol. and Obst.* 1934, lviii, 727; <sup>35</sup>*Ibid.* 959; <sup>36</sup>*Ibid.* lx, 223; <sup>37</sup>*Acta Radiol.* 1934, xvi, 390; <sup>38</sup>*Edin. Med. Jour.* 1934, May, 41, 49; <sup>39</sup>*Ann. of Surg.* 1933, xcvii, 26; <sup>40</sup>*Ibid.* 1934, xcix, 449; <sup>41</sup>*Lancet*, 1935, i, June 29, 1487; <sup>42</sup>*Brit. Jour. Radiol.* 1935, Feb., 87; <sup>43</sup>*Brit. Jour. Surg.* 1933 4, xxi, 131; <sup>44</sup>*Ibid.* 1934 5, xxii, 119; <sup>45</sup>*Brit. Jour. Radiol.* 1935, viii, Sept., 533; <sup>46</sup>*Ann. of Surg.* 1933, xcvii, 10; <sup>47</sup>*Amer. Jour. Surg.* 1934, xxvi, 300; <sup>48</sup>*Acta Radiol.* 1931, xv, 8.

## X-RAY AND RADIUM THERAPY. (See also CANCER, RADIO THERAPY OF; ETC., ETC.)

James F. Brailsford, M.D., M.R.C.S.

**Bone Tumours.**—During the year an interesting series of papers<sup>1-5</sup> have been published by Ewing, Meyerding, Bloodgood, Coley, and Simmons.

J. Ewing states: "It is my impression that radiologists, by their tendency to avoid biopsies, have acquired remarkable skill in interpreting clinical and radiological data and thus in general surpass the surgeons in diagnostic skill." Often the rate of growth, the extent of the disease, and the radiological details indicate the general nature and grade of malignancy of the process better than does the histological structure of the tumour, but this is not always the case. He points out that the histological structure of certain single lesions often wrongly suggests malignancy. While radiographic appearances may suggest the nature of a tumour, the response of the latter to X-radiation will sometimes definitely confirm the diagnosis.

Meyerding is of the opinion that removal of the primary growth by amputation, and post-operative irradiation and use of Coley's toxins, is the treatment of choice for osteogenic sarcoma.

Opinion as to the value of pre-operative irradiation differs: thus, while Bloodgood advises its use, W. B. Coley is against it, chiefly because he believes valuable time is wasted before operative measures. W. B. Coley's treatment with toxins calls for very careful investigation, for the results which he claims to have achieved are better than with any other form of treatment. He considers that the treatment of choice for osteogenic sarcoma is early amputation followed by prolonged treatment with Coley's toxins. C. S. Simmons supports this view, and states that "the experience of the Registry of Bone Sarcoma of the American College of Surgeons is that there has been no case of proved osteogenic sarcoma cured except by amputation or wide resection".

W. B. Coley and B. L. Coley,<sup>6</sup> in a paper dealing with "Five-year Cures of Malignant Bone Tumors", analyse the results of treatment of 360 cases of tumours of the long bones, and make the following claim in regard to a

**Ketodestrin.**—Ketohydroxy-oestrin for subcutaneous injection, supplied in 1-c.c. ampoules containing from 500 to 500,000 i.u. Boxes of 6 and 12 ampoules. (Paines & Byrne Ltd., Bilton Road, Greenford.)

**Larostidin.**—Larostidin histidine oral tablets have been introduced for use in peptic ulcer treatment as supplementary to Larostidin histidine injections (described in MEDICAL ANNUAL, 1935) to combat persistent flatulence. (See *Brit. Med. Jour.*, 1935, July 27, and *Dent. med. Week.*, 1935, No. 38). (The Hoffmann-La Roche Chemical Works Ltd., 51, Bowes Road, London, N.13.)

**Liver Extract.**—*Solution Liver Extract (Lederle) for Oral Use.*—A hydro-alcoholic solution of an active principle of liver extract (Cohn's fraction G); 10 c.c. represents the anti-anæmic potency of 100 gm. of liver (1 fluid ounce represents the anti-anæmic potency of 10½ oz. avoirdupois). It is for oral use in the treatment of pernicious anaemia. Dosage: from 20 to 60 c.c. (5 to 15 fluid drachms) daily. The maintenance dose is determined individually for each patient. Manufactured by Lederle Laboratories, New York. Literature sent on application to the distributors.

*Solution Liver Extract 1 c.c. Parenteral Refined and Concentrated (Lederle).*—A sterile aqueous solution, containing the nitrogenous non-protein fraction G of Cohn et al. obtained from fresh mammalian liver preserved with 0.5 per cent phenol. Each 1 c.c. represents the anti-anæmic potency of 100 gm. of whole liver. It is intended for intramuscular injection in the treatment of pernicious anaemia and sprue. Dosage: to ensure optimum dosage for cases of pernicious anaemia in relapse it is advisable to make an injection of 1 c.c. each day for three or four successive days. In a series of cases in which remissions have been thus initiated there is evidence that weekly injections of 1 c.c. provide sufficient active material to complete the remission and maintain a satisfactory blood picture. In complicated cases and those with extensive neurologic involvement, the optimum dosage may be much larger and must be determined for each patient. Manufactured by Lederle Laboratories, New York. Literature sent on application to the distributors. (Chas. F. Thackray Ltd., Park Street, Leeds, and 252, Regent Street, London, W.1.)

**Mandelic Acid B.D.H. Outfit.**—This outfit is designed to facilitate the practice of mandelic acid therapy as a substitute for a ketogenic diet in the treatment of urinary infections. The technique of mandelic acid treatment has been described in the *Lancet*, 1935, May 4, p. 1032, and full particulars of the B.D.H. Outfit are given in a descriptive booklet on the subject. (The British Drug Houses, Ltd., Graham Street, London, N.1.)

**Mandelic Acid (Boots).**—A new antiseptic for use in the treatment of urinary infections unassociated with urinary obstruction, and replacing dietary measures in the treatment of chronic infections of the urinary tract. The standard mixture used at University College Hospital contains 3 gm. of mandelic acid per ounce just neutralized by sodium bicarbonate (1.6 gm.) and flavoured with lemon. Ammonium chloride is also given to ensure acidity of the urine (*Lancet*, 1935, i, 1032; ii, 741). Supplied in bottles of 4 oz. and 8 oz. A 4-oz. bottle is sufficient for nine days' treatment. (Boots Pure Drug Co. Ltd., Nottingham.)

**Merfenil (Phenylmercuric Nitrate).**—Combines the highest bactericidal and fungicidal potency yet discovered for any class of compounds, with relatively low toxicity for animals and man. For use in fungoid and bacterial skin infections and in gynaecology. Supplied as powder and as ointment containing 1-1000. (Pharmaceutical Specialities (May & Baker) Ltd., Dagenham.)

**Multivite Pellets.**—During the past few years physicians have suggested that a concentrate containing the fat-soluble vitamins A and D and the water-soluble vitamins B and C would be of considerable value. Each Multivite Pellet contains vitamins A, D, and C in the following proportions: vitamin A, 3000 international units; vitamin D 600 international units; vitamin C, 100 international units. There is also a measured proportion of the vitamin B complex equivalent to 2 gr. of distiller's yeast, but as at present there are no standards for the various components of this complex, with the exception of vitamin B<sub>1</sub>, it is impossible to express the content of the pellets in terms of any unitage. Multivite Pellets are presented to the medical profession not as a specific for overcoming acute deficiency diseases, but as a medium through which to administer the group of vitamins A, B, C, and D, a deficiency of which is manifested in a proneness to infection and a general ill-defined feeling of being 'out of sorts'. The pellets are chocolate-coated and can be crunched and eaten as an ordinary sweetmeat or swallowed whole. (The British Drug Houses, Ltd., Graham Street, London, N.1.)

**Neo-Olesal.**—A 10 per cent solution of bismuth dimethyl-endomethylene-hexahydrobenzoate in oil. This preparation is well tolerated, and can be used in all stages of syphilis. It is given by intramuscular injections of 2 c.c. two or three times weekly. The total dosage during one course of treatment usually amounts to 25 or 30 c.c. In small children injections of 0.05 c.c., increasing to 0.1 and 0.2 c.c., according to age, are well tolerated. Older children receive half the adult dose. Neo-Olesal is supplied in boxes of 10 ampoules of 2 c.c. (Bayer Products Ltd., Africa House, Kingsway, London, W.C.2.)

**Neothacine (Thackray).**—A new oral and nasal antiseptic, containing as active ingredients powerful bactericidal derivatives of *p*-hydroxybenzoic acid, having phenol coefficients of 15 and 83. Important properties claimed for this preparation are that it is: (1) Non-toxic and non-irritating; (2) Mildly analgesic; (3) Rapidly bactericidal even in high dilution; (4) Highly penetrating, thus producing a lasting antiseptic effect; (5) Pleasantly flavoured, deodorizing, and refreshing. It may be used as a gargle in treatment of general oral sepsis, streptococcal sore throats, tonsillitis, etc., or as a nasal douche or spray in acute coryza and post-nasal infections, chronic rhinitis, etc. In all cases used in a dilution of 1-7. (Chas. F. Thackray Ltd., Park Street, Leeds.)

**Nov-Umbrose Barium Cream.**—A concentrated (1 in 1) preparation of barium sulphate, ready for immediate use, either oral or rectal; particularly useful for rectal administration. Can be measured. Remains well suspended. Report from a leading hospital: "The best shadow we have ever obtained". Suggestions for dilution: 6 oz. of BaSO<sub>4</sub>, or 6 fl. oz. of this cream, diluted with warm water to about one pint, is the usual quantity for oral use; 10 oz. of BaSO<sub>4</sub>, or 10 fl. oz. of this cream, diluted with warm water to about three pints, is the usual quantity for administration as an enema. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

**Östroform.**—Östroform presents the pure crystalline follicular hormone for the treatment of conditions arising from ovarian deficiency. It is becoming increasingly recognized that Östroform therapy is not purely substitutive. The genital hyperplasia it induces has a lasting effect in rendering subsequent menstruation easier.

**Östroform 'B'.**—The injection of large doses of the follicular hormone has been facilitated by the introduction of Östroform 'B' (the benzoic ester of the follicular hormone). This preparation has the further advantage of giving a prolonged action, distinctly more beneficial in severe cases than several equally large doses of the hormone itself. (The British Drug Houses, Ltd., Graham Street, London, N.1.)

**Östrosolve.**—Ointment for local application containing oestrin and other hormones. Indicated in the treatment of irritating skin conditions at the menopause. 1-oz. jars. (Paines & Byrne Ltd., Bilton Road, Greenford.)

**Orgidine.**—A new non-toxic organic iodine compound. Each capsule is equivalent to  $\frac{1}{2}$  gr. pure iodine or 11 minims Lugol's solution. The possibility of iodism occurring is remote except with massive doses, as solution does not take place in the stomach but in the alkaline secretion of the duodenum. Among its many applications are the following: rheumatoid arthritis, polyarticular arthritis, bronchitis and bronchiectasis, obesity, goitre. (Reynolds & Branson, 13, Briggate, Leeds.)

**Ostocalcium.**—This is the original preparation of calcium sodium lactate with sufficient pure crystalline vitamin D (Calciferol G.L.) to ensure its assimilation. Each tablet contains  $7\frac{1}{2}$  gr. of the double salt and 500 international units of vitamin D. To facilitate swallowing, the tablets have cleavage lines at which they can be broken into four sections. Ostocalcium is recommended for the following purposes: the maintenance of calcium reserves in pregnancy; prevention and treatment of chilblains, urticaria, and other capillary vasomotor disturbances; routine pre- and post-operative treatment; treatment of menorrhagia, exudative skin diseases, migraine, delayed union of fractures, tuberculosis, and general debility. The dose is 1 to 12 tablets daily. (Glaxo Laboratories Ltd., Greenford, Middlesex.)

**Perhepar.**—Liver extracts concentrated—Ext. Hepatis Liq. B.P. and Ext. Hepatis Sicc. B.P. Indicated in pernicious anaemia. Palatable, stable, and potent. Issued in ampoules, 2 c.c. and 10 c.c., in bottles from 4 oz. to 80 oz., and in phials of powder each equivalent to 8 oz. of fresh liver. (Gedeon Richter (G. B.) Ltd., 1-2, Hardwick Street, London, E.C.1.)

**Petrolagar with Cascara.**—This new variety of Petrolagar possesses the advantages of the plain emulsion together with that of fluid extract of cascara. It associates cascara with an entirely new flavour, which is non-bitter. Dose: For adults—a dessertspoonful

or more if needed, morning and night; diminish to occasional dose as required. For children— $\frac{1}{2}$  teaspoonful once daily for several days, then occasionally when needed. Dilute with water or milk if desired. (Petrolagar Laboratories, Braydon Road, London, N.16.)

**Phospho-soda (Fleet).**—A pure, stable, highly concentrated solution of primary sodium phosphate, differing from the ordinary sodium phosphate, and existing in solution as a definite salt. Unlike other salines it has a marked effect on the hepatic system as well as the gastro-intestinal tract and possesses a buffering action against acidity. It is very acceptable to a sensitive stomach and does not irritate the intestinal mucosa. It is effective in cutting and eliminating excess mucus; it eliminates toxic material, expels flatulence, cleanses and empties the intestines, and favourably influences the natural functions of the liver. It increases the biliary flow and in duodenal drainage it will be found more effective than magnesium sulphate or other agents. The preparation also mildly stimulates the renal tract and in cases of cystitis and pyelitis, in small doses, it promotes acidulation of the urine and proves an efficient urinary antiseptic; when hexamine is indicated Phospho-soda (Fleet) furnishes the acid medium necessary for the elaboration of formic aldehyde. Prior to surgical intervention it constitutes a good laxative on account of its cleansing and eliminating action, and after operations it is helpful in overcoming post-operative nausea and assists in relieving the effects of the anæsthetic. (The Anglo-French Drug Co. Ltd., 11-12, Guilford Street, London, W.C.1.)

**Pitexan.**—Highly standardized and carefully prepared anterior pituitary hormone. Recommended especially where both the growth and gonadotropic hormones are required. Dosage 1-3 capsules t.d.s. a.c. Bottles of 25 and 100 capsules. (Faines & Byrne Ltd., Bilton Road, Greenford.)

**Planacrine.**—Lozenges containing 3:6-diamino-10-methylacridinium chloride. They are free from irritating effects on mucosa and possess powerful bactericidal properties. For the prevention of infections and the treatment of tonsillitis, gingivitis, etc. Issued in pocket tins of 40, each 3 mgrm. (Pharmaceutical Specialities (May & Baker) Ltd., Dagenham.)

**Proctocaine.**—A combination of oil-soluble drugs producing immediate local anæsthesia which lasts seven to twenty-eight days, through slow, uniform absorption. Delayed onset of the anæsthesia is prevented by the addition of an anæsthetic which is soluble in water as well as oil, and so diffuses quickly on injection and acts promptly, but is compatible with the other ingredients. Indications: pruritus ani, anal fissure, prolapsing piles, hæmorrhoidectomy, pruritus vulva, perineal tears, lumbago, pain after rectal operations, and pain due to carcinoma of the rectum. Dose: 5 to 30 c.c. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

**Progestin B.D.H.**—It has been established that the corpus luteum hormone, progestin, consists of four isomeric luteosterones, two of which are inactive. The rôle of the active hormones has been elucidated, and their action in preparing the uterus for the nidation of the ovum suggests that the administration of Progestin B.D.H. will produce beneficial results in many cases of sterility and habitual abortion. Certain forms of dysmenorrhœa have also proved amenable to progestin therapy. (The British Drug Houses Ltd., Graham Street, London, N.1.)

**Prostigmin.**—A stable physostigmine analogue, described in the 1935 MEDICAL ANNUAL (p. 504) as a peristaltic stimulant, has been found to yield dramatic results in myasthenia gravis. (See *Lancet*, 1935, Feb. 23, p. 432, and *Brit. Med. Jour.* 1935, March 9, p. 463). This condition is thought to be due to a disturbance of the normal function of acetylcholine by too rapid hydrolysis, since no structural changes can be traced in the nerves themselves. Prostigmin, by counteracting the acetylcholine-destroying agent, restores normal function. Its effect sets in ten minutes after injection, and lasts, according to the dose, from three to eight hours. Larger doses are required than for dealing with post-operative intestinal paresis, gaseous distension, etc., and a special packing consisting of a 5-c.c. rubber-capped vial of concentrated Prostigmin solution (2.5 mgrm. per c.c.) has therefore been introduced for the purpose. (The Hoffmann-La Roche Chemical Works Ltd., 51, Bowes Road, London, N.13.)

**Redoxon.**—Since the publication of the MEDICAL ANNUAL for 1935, Redoxon ampoules have been introduced for the administration of vitamin C by injection. They are issued in boxes of six pairs of ampoules, one of which contains 100 mgrm. of ascorbic acid in the form of sodium ascorbate, and the other 2 c.c. of sterile distilled water. (The Hoffman-La Roche Chemical Works Ltd., 51, Bowes Road, London, N.13.)



**Sodium Mandelate (Boots).**—A new antiseptic for use in the treatment of urinary infections unassociated with urinary obstruction, and replacing dietary measures in the treatment of chronic infections of the urinary tract (*Lancet*, 1935, i, 1032, ii, 741). It has been customary to administer mandelic acid in the form of its sodium salt obtained by neutralization of the acid with sodium bicarbonate. This preliminary neutralization may be avoided by using the sodium salt supplied as Sodium Mandelate (Boots). The dosage for adults is 3·5 grm. (approx.), given four times a day immediately after each meal. For children the dosage is in proportion to age. Ammonium chloride is also administered after each meal to ensure acidity of the urine. Sodium Mandelate (Boots) is supplied in bottles of 4 oz. and 8 oz. A 4-oz. bottle is sufficient for eight days' treatment. (Boots Pure Drug Co. Ltd., Nottingham.)

**Staphylococcus Serological Product.**—Immunization with Staphylococcus Toxoid has been used recently as a combined method of prophylaxis against, and treatment of, chronic infections. In Melbourne and Toronto highly promising results from considerable numbers of patients have been reported in conditions such as recurring boils and carbuncles and chronic staphylococcal skin diseases, e.g., acne, sycosis, and blepharitis. English experience is not yet large, but the general results, obtained mainly during the course of an investigation by the Therapeutic Trials Committee of the Medical Research Council, agree with those reported elsewhere. This investigation was carried out with Staphylococcus Toxoid supplied by the Wellcome Physiological Research Laboratories. In a considerable number of patients 'cure' has been obtained; in many 'improvement'; and in a small number 'no improvement'. There are on record a few instances of puzzling relapses in patients who had shown rapid disappearance of long-standing symptoms. Two preparations are issued: 'Wellcome' Brand Staphylococcus Toxoid A—for active immunization (1-10 dilution), and Staphylococcus Toxoid B—for active immunization (Undiluted Toxoid), each in containers of 1 c.c.. Supplies may be obtained from Burroughs Wellcome & Co., Snow Hill Buildings, London, E.C.1.

**Staphylococcus Toxoid.**—The formalinized toxin from cultures of staphylococcus. Indicated for the treatment of all types of localized staphylococcal infection. The toxoid is issued in rubber-capped vials of 10 c.c. in both 'strong' and 'weak' solution. (This weaker strength is to enable smaller doses to be obtained with greater accuracy, and also to provide a strength suitable for the treatment of children.) It is also supplied in sets of eight doses of 0·1, 0·2, 0·3, 0·4, 0·5, 0·6, 0·8, and 1 c.c. of the 'strong' solution, diluted so that the dose is contained in 1 c.c. of solution. This toxoid is prepared in the Inoculation Department of St. Mary's Hospital, London; sole distributing agents, Parke, Davis & Co., 50, Beak Street, W.1.

**Staphylococcus Vaccoid.**—This mixture of staphylococcus toxoid and staphylococcus vaccine constitutes a complete staphylococcal antigen. The presence of vaccine does not interfere with the production of antitoxin in response to the toxoid, and it gives an additional antibacterial immunity. It is supplied in 10-c.c. rubber-capped bottles of 60 million staphylococci per c.c., with weak staphylococcus toxoid, and 300 million staphylococci per c.c. with strong staphylococcus toxoid. (The weaker strength is to enable smaller doses to be obtained with greater accuracy and also to provide a strength suitable for the treatment of children.) It is also supplied in sets of eight graduated doses. This Vaccoid is prepared in the Inoculation Department of St. Mary's Hospital; sole distributing agents, Parke, Davis & Co., 50, Beak Street, W.1.

**Stellidin.**—A sterile aqueous solution of histidine hydrochloride for the treatment of gastric, duodenal, and jejunal ulcers. Issued in boxes of 6 ampoules each containing 5 c.c. of a 4 per cent solution. One injection is given a day for three weeks or rather longer in some cases. (Pharmaceutical Specialities (May & Baker) Ltd., Dagenham.)

**Syrup Calcium Gluconate (R & B).**—Intended primarily for calcium deficiency in adults and children, has in addition many other applications. It has definite influence on respiratory diseases and in relaxing bronchial spasm. Also useful in debility, neurasthenia, rheumatic cardiac trouble, and urticaria. (Reynolds and Branson, 13, Briggate, Leeds.)

**Tannic Acid Jelly (Duncan).**—A non-greasy antiseptic and water-soluble application, containing acid tannic 5 per cent with phenol 0·5 per cent. This preparation may be applied direct from the collapsible tubes to the affected part. Eliminates the necessity of preparing fresh tannic acid solutions for the treatment of burns, scalds, cuts, abrasions, etc. Being water-soluble this jelly is easily bathed off when frequent dressings are necessary. (Duncan, Flockhart & Co., Edinburgh and London.)

**Theotone Tablets.**—A British-made combination. Each tablet contains 5 gr. of theobromine with  $\frac{1}{2}$  gr. of phenobarbitone. Indications: high blood-pressure, angina pectoris, hyperthyroidism, menopausal disorders, and allied conditions. Dose for adults: one or two tablets with water about two or three times a day, in accordance with the physician's instructions. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

**Thoragel and Thoragel C.**—Preparations for the treatment of pulmonary tuberculosis by gelatino-thorax. Thoragel is a solution containing gelatin and acriflavine. In Thoragel C. sodium chloride is incorporated. Also used in the treatment of tuberculous glands, psoas abscesses, tuberculosis of the joints, and tuberculous laryngitis. Supplied in ampoules containing 5 c.c. and in rubber-capped bottles containing 25 c.c. (Pharmaceutical Specialities (May & Baker) Ltd., Dagenham.)

**Tridestrin.**—Tri-hydroxy-a-strin for oral use, in coated tablets containing 500, 1000, and 5000 i.u. Bottles of 25 and 100 tablets. (Paines & Byrne, Bilton Road, Greenford.)

**Tuberculin P.P.D.**—Tablets containing the purified protein derivative obtained from standard tuberculin by the method of Florence B. Seibert. Extraneous proteins are eliminated while the substance responsible for the specific reaction is retained. These tablets are available in two strengths. Each first strength tablet contains 0.0002 mgrm. of purified protein derivative, each second strength tablet contains 0.05 mgrm. When dissolved in 1 c.c. of buffered diluent, each tablet provides material for applying the intradermal test to ten patients. (Parke, Davis & Co., 50, Beak Street, W.1.)

**Vince Brand Powder.**—Contains high-grade sodium perborate which, when in solution with water, yields approximately 9.5 per cent of nascent oxygen. This product is thus an exceptionally efficient antiseptic and bactericide for the inhibition and destruction of those pathogenic organisms with which it comes in contact. Vince claims these important advantages: it is alkaline in reaction; it is bactericidal; it is not caustic or toxic; it aids in removing tissue or debris; it deodorizes and is palatable in use. It is indicated in the following conditions: acute follicular tonsillitis, Vincent's angina, acute and chronic rhinitis, purulent rhinitis, acute pharyngitis. Supplied to the public in 2-oz. and 5-oz. tins, and has met with immediate success. (Wm. R. Warner & Co. Ltd., 300, Gray's Inn Road, W.C.1.)

**Vinyl Ether.**—A new inhalation anæsthetic. Gives rapid induction and recovery and is free from post-anæsthetic nausea or vomiting. Vinyl Ether may be administered by open or closed methods and is used alone or in conjunction with other anæsthetics. Supplied in bottles of 25 c.c. and 75 c.c. (Pharmaceutical Specialities (May & Baker) Ltd., Dagenham.)

**Viormone.**—1-c.c. ampoules of solution for hypodermic use, containing  $\frac{1}{2}$  and 2 capon units of the male sex hormone, prepared from testes, and therefore of greater activity than that extracted from urine. Boxes of 6 and 12 ampoules of each strength (Paines & Byrne Ltd., Bilton Road, Greenford.)

**Zincol (R & B).**—A compound zinc ointment containing as an antiseptic a halogen of xylenol. This ointment, with a completely new type base, is delicately perfumed and tinted, and is proving highly popular. A good general ointment, soothing and antiseptic. (Reynolds & Branson, 13, Briggate, Leeds.)

## MEDICAL AND SURGICAL APPLIANCES.

**Abdominal Retractor for Operations on the Biliary Tract.**—Mr. James H. Saint, F.R.C.S. (Newcastle-on-Tyne), writes: "In operations on the biliary tract the efficient exposure of the cystic and common ducts is, on occasion, not only difficult to achieve but even more difficult to maintain. The diagram (*Fig. 74*) shows a retractor designed with certain features to overcome these difficulties, and I have found it very useful in practice. The vertical position of the handle reduces considerably the exertion and fatigue of the assistant, so often noticeable when his hand and wrist are forced to assume an unnatural position by a horizontally attached handle. The blade is tilted backwards at an angle of  $10^{\circ}$  from the vertical in order to compensate for the forward 'fatigue tilt' which often results in loss of exposure at a crucial moment. Its depth is increased

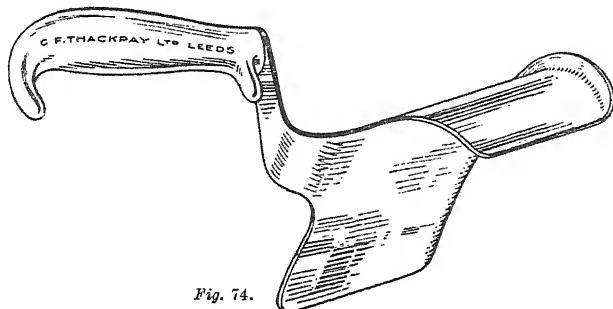


Fig. 74.

another inch by the ascending portion of the shank, and is capable of dealing with subjects of generous obesity. The lower end of the blade curves forward fairly sharply and forms an efficient barrier against the peregrinations of the colon and omentum. The concavity formed by this curve adds considerably to the ease of exposure of the common duct, and provides extra space in which to work. The retractor should be placed so that the upper end of the blade is in contact with the under surface of the liver, and the direction of retraction should be in the transverse plane. (Chas. F. Thackray Ltd., Park Street, Leeds, and 252, Regent Street, London, W.1.)

**Adenoidectomy Instruments** (*Fig. 75*).—Mr. J. Angell James, F.R.C.S. (Bristol), has designed a set of instruments for adenoidectomy when using a Boyle-Davis gag. The curette illustrated enables all parts of the adenoid-bearing area to be easily accessible, even when the neck is fully extended and the Boyle-Davis gag suspended. The

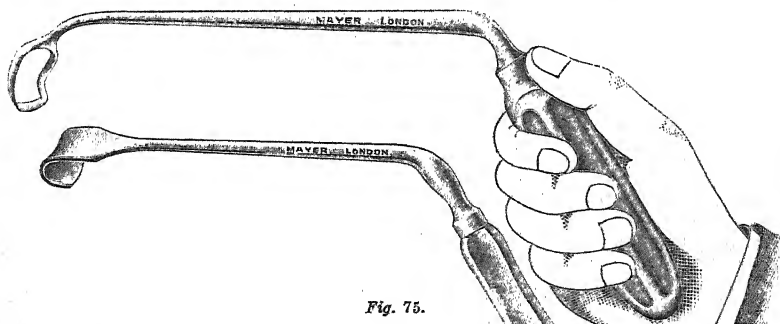
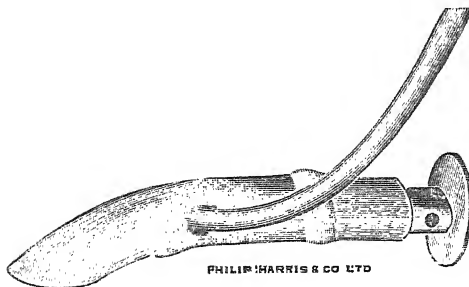


Fig. 75.

palate retractor gives a direct view of the adenoid wound. A sponge-holding forceps is used with swabs soaked in tinct. benzoin. co. to arrest bleeding while the head and neck are fully extended, thus guarding against inhalation of blood or fragments of tissue. (Mayer & Phelps Ltd., Chiron House, 59-61, New Cavendish Street, London, W.1.)

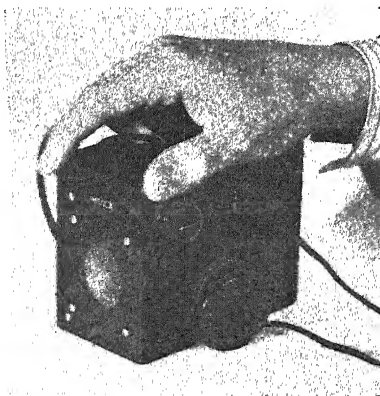
**Airway for Nasal Operations.**—The airway illustrated in *Fig. 76* was devised by Mr. B. Seymour Jones, Surgeon to the Ear and Throat Hospital, Birmingham. It is a modification of the well-known 'Phillips' airway with the addition of a lateral tube 14 in. in length for the administration of ether pumped in by a machine. A great



*Fig. 76.*

service from these airways has been found in Caldwell-Luc and endonasal operations, septum operations, and cartilage grafts for depressed bridge of the septum, as the lateral tube can lie in the angle of the mouth well out of the way. Right and left variations and children's sizes. (Philip Harris & Co. (1913) Ltd., Edmund Street, Birmingham, 3.)

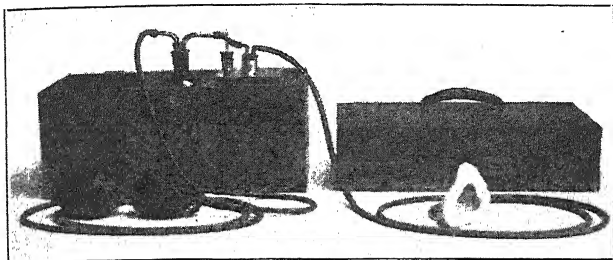
**Amplivox.**—It has long been known that deaf aids employing valve amplification give better results than the ordinary electrical aid consisting of a microphone, an ear-piece, and a dry battery; but they have not been much used on account of the large size and weight. The introduction of the midget valves has now made it possible to produce valve instruments very much smaller than earlier models; and the small



*Fig. 77.*

size of the Amplivox can be seen from the illustration (*Fig. 77*). This instrument employs a high quality microphone, two stages of valve amplification, a dry battery, and an accumulator giving twenty hours use per charge. The advantages of this type of hearing aid are that the level of background noise is lower, the amplified sound is practically free from distortion, the high notes are amplified so that it is useful for nerve deafness where electrical aids have previously proved unsatisfactory, and the low motional impedance of the diaphragm makes the instrument useful for general conversation, meetings, etc. The price of the model illustrated is £15 18s. 0d. (Amplivox Ltd., 106, George Street, Portman Square, London, W.1.)

**Anæsthetic Apparatus.**—*Fig. 78* shows a portable anæsthetic apparatus for self-administration in midwifery, devised by Dr. R. Francis Jones, of Tamworth. The apparatus is described as a modification of Shipway's ether apparatus, without a device for chloroform. The hot water is contained in a chromium-plated copper container, and the heat is diffused by means of copper shavings around a standard one-pint bottle

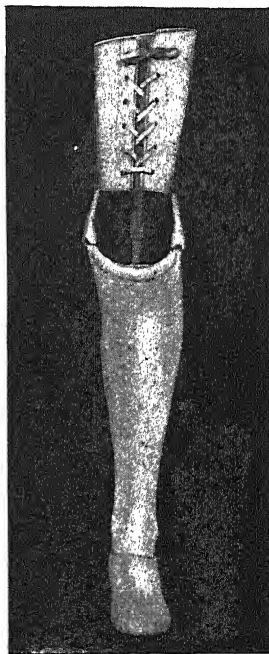


*Fig. 78.*

of ether. A Tyrell's mask is used and connected to the apparatus by a long uninkable tube. The bellows is attached to the instrument in a similar manner. The bayonet-socket joints connecting the outfit are non-reversible and thereby prevent any possibility of fluid ether being pumped to the mask. The outfit is contained in an oak carrying case which has a removable lid. A descriptive reprint from the *British Medical Journal*, 1935, Nov. 30, p. 1050, will be sent on application. (Philip Harris & Co. (1913) Ltd., Edmund Street, Birmingham.)

**Anæsthetic Table.**—An anæsthetic table for hospital use has been designed by Dr. H. Gordon Greaves for the Cardiff Royal Infirmary, including in one unit facilities for practically all methods of modern inhalation anæsthetics. On the top shelf are fitted flowmeter, mercury blow-off, and Shipway's wide-bore ether and chloroform apparatus. Accommodation is provided for cylinders of  $O_2$ ,  $CO_2$ , and  $N_2O$ , and for a vacuum flask for warming the gases. Rubber tubing is reduced to a minimum by the use of metal tubing permanently fixed to the table, and a drawer and basket are provided for accessory masks, syringes, gas keys, and other necessary emergency instruments. (Mayer & Phelps Ltd., Chiron House, 59-61, New Cavendish Street, London, W.1.)

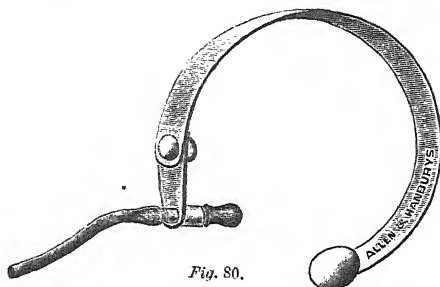
**Artificial Limb.**—*Fig. 79* portrays a recent design of limb for below-knee amputations. It is constructed from a seamless shin of Alclad—the strongest corrosion-resisting light metal known. The specially made ball-bearing knee-joints are fitted internally and the working clearance between the patent cushion-joint foot and the shin is almost imperceptible. The result is a perfectly smooth outline, lightness, and great strength. The socket for the stump is moulded from an accurately rectified cast ensuring a good fit and correct weight-bearing points. (Desoutter Bros. Ltd., 73, Baker Street, London, W.1.)



*Fig. 79.*

**Auriscope.**—The Keeler operating auriscope is designed to study both examination and accessibility. The distal method of illumination whereby the observer looks along the beam of light gives a brilliantly lighted field; whilst the large open area between the generous mouth of the speculum and the viewing lens gives plenty of freedom for aural instruments. (C. Davis Keeler, 47, Wigmore Street, London, W.1.)

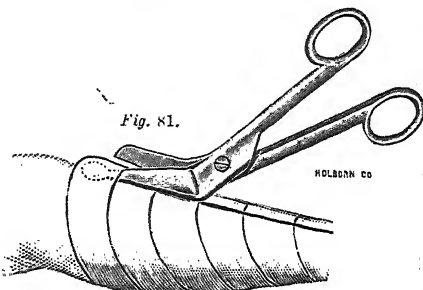
**Auscultation Tube (Paget's)** (*Fig. 80*).—This is an improvement on the old-fashioned otoscope, which frequently falls from the ear just when it is required. The apparatus



*Fig. 80.*

consists of a simple spring head band with adjustable joint and aural mount. Price 13s. 6d. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

**Bandage Shears** (*Fig. 81*).—For removing elastoplast or similar dressing, with blunt flat tip on lower blade to insert between the bandage and the skin. Chromium plated. British make, 5s. 6d. per pair. (The Holborn Surgical Instrument Co. Ltd., 26, Thavies Inn, London, E.C.1.)



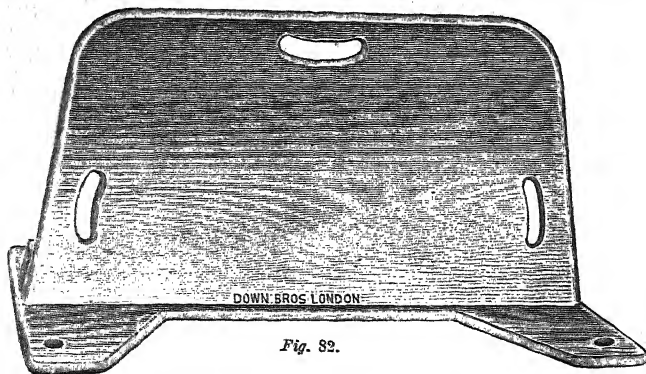
*Fig. 81.*

**Barrel Type A.C. Transformer for Caution and Light (Earth-Free).**

—Suitable for 100, 200, 220, and 240 volts. The current for lamps is regulated by a rheostat giving from 0-12 volts. The cautery current, also regulated by a rheostat, will give up to 25 amperes.

(Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

**Bedclothes Support and Exerciser (Fripp-McConnel).**—This apparatus (*Fig. 82*) has been designed to serve two purposes: (1) To keep the weight of the bedclothes off the



*Fig. 82.*

patient's feet, and, by supporting the soles of the feet, to prevent his getting foot-drop. (2) To help him to exercise certain muscles while lying in bed, so as to shorten his convalescence when he is up. The support and exerciser can be used with advantage in any case where a patient is confined to bed; but it is particularly useful in long debilitating illnesses when the leg muscles and the sense of balance tend to deteriorate. (Messrs. Down Bros., 21 & 23, St. Thomas's Street, London, S.E.1.)

**Benzedrine Brand Inhaler** (*Fig. 83*).—This volatile vasoconstrictor is indicated for shrinking the nasal mucosa in head colds, sinusitis, vasomotor rhinitis, hay fever, and asthma, and a number of articles in the literature bear witness to the excellent clinical results obtained in these conditions by various observers. Each tube is packed with benzyl methyl carbinamine 0.325 grm., ol. lavand. 0.097 grm., and *l-p*-menthan-3-ol. 0.032 grm. Although Benzedrine Brand Inhaler exhibits in vapour phase a vasoconstrictive potency greater than that of ephedrine, there is no secondary returgescence



Fig. 83.

or atony following its use. The application of a vapour to the nasal mucosa presents obvious advantages over liquid inhalants applied by droppers, atomizers, sprays, or tampons. This fact, together with the convenient size of the tube, ensures the full co-operation of the patient because the inhaler can be used inconspicuously at any indicated time. Price, 2s. The manufacturers will be glad to send samples and literature on request. (Menley & James Ltd., 64, Hatton Garden, London, E.C.1.)

**Blood-transfusion Needle** (*Fig. 84*).—This needle, designed by Mr. G. H. Macnab, F.R.C.S., presents a hollow-ground cutting edge to the skin surface on entry. The under surface has been bevelled back to meet the cutting edge, so that the whole of the lumen enters the skin at the same time. The needle consists of metal and glass



Fig. 84.

portions, but a wide lumen of increasing diameter is maintained throughout. A flow of blood in the glass tube tells the operator at once that the vein has been entered, and permits him to concentrate his attention on the needle. (Donald Rose, 36, George Street, Manchester Square, London, W.1.)

**Bone Nails.**—*Fig. 85* shows a triradiate fin nail with large central cannula, used by Mr. R. Watson Jones for his operation for fractures of the neck of the femur. The special features are the thin fins and large central cannula which allow the surgeon to use the nail over a graduated pin which is previously driven in the correct position. As there is a tendency for all bone nails to extrude after they have been inserted for some time, Mr. Watson Jones has recently been using a small cap with two screws (*Fig. 86*). Another instrument used in the operation is the shadow-projecting rod, a malleable instrument with marked graduations at every  $\frac{1}{4}$  in.



Fig. 85.

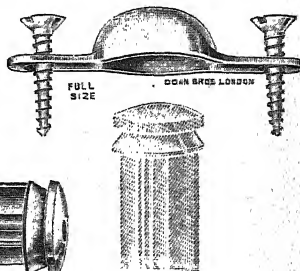


Fig. 86.

This instrument when photographed on a line with the bone gives an accurate comparison shadow and facilitates the selection of the correct length of tri-fin nail. (Down Bros. Ltd., 21 & 23, St. Thomas's Street, London, S.E.1.)

**Lloyd-King Nails** (modified from Smith-Petersen).—These stainless steel nails (*Fig. 87*) are designed for use with Eric Lloyd's director, though they are equally suitable for any other method of operating upon fractured necks of the femur. The nails differ from the standard design in the following particulars: (1) The head is twice the usual thickness, being 1 cm. deep and is traversed by a threaded hole 6 mm. in diameter. (2) The nails are made in seven lengths from 7 cm. to 10 cm. with an interval of 0.5 cm. between each consecutive pair. (3) The length of each nail (excluding the head) is



Fig. 87.

engraved on the head and no engraving is permitted on any other part. (4) Each of the three flanges is snagged like the edge of a saw for 3 cm. adjacent to the head; this is intended to counteract any tendency for the nail to come out when it has once been inserted. (5) One of the three flanges is made 2 mm. shorter than the other. This shorter flange is directed proximally when used with Eric Lloyd's director. (6) The nails are made in two diameters—the ordinary standard 13 mm. and a larger one of 16 mm. For a description of Mr. Eric Lloyd's operation see *The Lancet*, 1935, July 20.

**Lloyd-King Nail Introducer** (*Fig. 88*).—This is a threaded stainless steel rod which screws into the head of the nail. It is used to pick out the selected nail from the sterilized case containing the set of seven and to start the nail the first few millimetres



Fig. 88.

into the cortex of the great trochanter. All temptation to handle the nail is thus removed, and the short flange of the nail can be placed in the correct orientation during introduction. As soon as the nail has started on its course the introducer can be unscrewed and an ordinary punch used to complete the nailing.

**Sterilizable Metal Case for Lloyd-King Nails** (*Fig. 89*).—This is a strongly made metal cylindrical case with a screw-top lid. It contains a

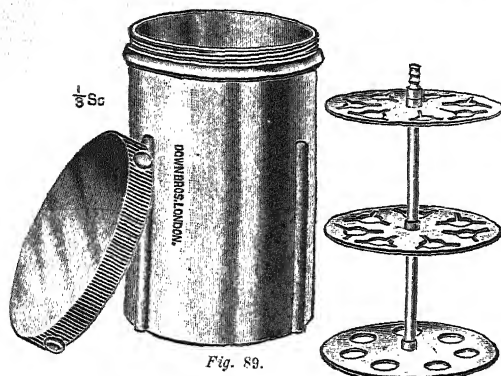


Fig. 89.

cruet-stand fitting, which is made to take one set of seven Lloyd-King nails of 13 or 16 mm. diameter. The case is half filled with water and the lid screwed down half a turn before boiling the nails. Thereafter no handling is necessary, and as the length of each nail is engraved on the outside of the head, it is easy to select the right length of nail. Moreover, the absence of any one of the seven sizes of nail is immediately noticed if they are kept in this case. (Down Bros. Ltd., 21 & 23, St. Thomas's Street, London, S.E.1.)

**Bonochord Hearing Aids.**—These instruments are made with the correct magnification to make up the patient's hearing deficiency to prescription, or after testing the degree of the patient's hearing acuity. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)



**Cannula** (*Fig. 90*).—Mr. Harold Dodd writes: "A simple but efficient cannula has been made for me by Down Brothers. It consists of a blunt needle, slightly bent at the end, and with an extra hole laterally  $\frac{1}{8}$  in. from the tip. To prevent the cannula slipping out of the vein a small bead is fixed in the shaft. A flexible, tight-fitting



Fig. 90.

trocar which protrudes slightly at the end is fitted; it assists the insertion into the vein and prevents clotting of blood in the cannula during the short interval which occurs between the insertion into the vessel and the beginning of the injection. They are made in several sizes. I have used it with satisfaction for over a year." (Down Bros., Ltd., 21 & 23, St. Thomas's Street, London, S.E.1.)

**Cartonia Indicator.**—This indicator has been designed for doctors, dentists, and out-patient departments, to advise patients in the waiting-room that the consultant is ready to see them. The consultant has a press-button on the desk, which on being pressed operates a buzzer and causes the indicator in the waiting-room to become illuminated. When the patient enters the consulting-room and closes the door, both the indicator and buzzer are cut off. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

**Catheter Adaptor.**—*Fig. 91* is an illustration of Oliver Walker's catheter adaptor for attaching to Record syringes to fit funnel-end catheters for washing out the

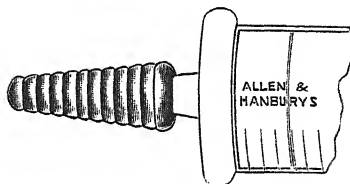


Fig. 91.

bladder and other similar procedures. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

**Catheter Tube.**—Unbreakable, made of non-inflammable celluloid, with india-rubber cork and receptacle for holding formalin tablets. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

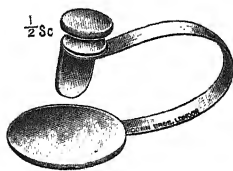


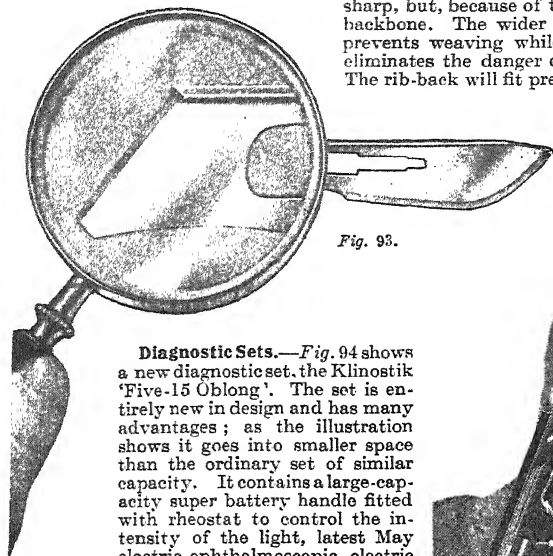
Fig. 92.

**Coin Pleximeter** (*Fig. 92*).—Dr. David A. Herd (Stoke-on-Trent) writes: "I have for some time used this small instrument, and believe it may be of use to other chest clinicians. Previously the 'coin test' for the presence of pneumothorax or cavity was carried out by an assistant tapping with two coins on the patient's chest. It will be seen that my device dispenses with the assistant, and can be easily operated by the physician himself with one hand." (Down Bros., Ltd., 21 & 23, St. Thomas's Street, London, S.E.1.)

**Crutch.**—A new crutch has been introduced for use in cases of partial paralysis and severe cases of arthritis. The forearm rests on a long padded tray with an extension to take the upper arm and a vertical handle in front. They can be held close to the sides and the whole weight of the body is completely supported while the legs are moved forward either one or both at a time. All straps are press-buttoned on, so that if a fall occurs the arms will not be trapped. (J. & E. Ferris, 33, Museum Street, London, W.C.1.)

**Detachable Blade.**—The Bard-Parker new rib-back blade (*Fig. 93*) represents a great improvement in detachable blade design. It possesses the rigidity and strength of the solid scalpel, and is not only extremely sharp, but, because of the rib-back, literally has a backbone. The wider back afforded by the rib prevents weaving while making an incision and eliminates the danger of cutting the glove finger. The rib-back will fit present B.P. handles. (Chas.

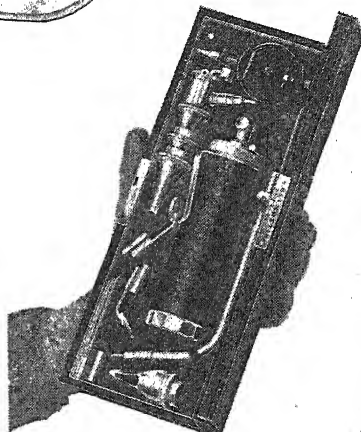
F. Thackray Ltd., Park Street, Leeds, and 252, Regent Street, London, W.1.)



*Fig. 93.*

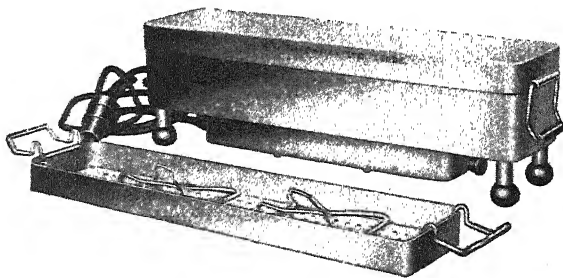
**Diagnostic Sets.**—*Fig. 94* shows a new diagnostic set, the Klinostik 'Five-15 Oblong'. The set is entirely new in design and has many advantages; as the illustration shows it goes into smaller space than the ordinary set of similar capacity. It contains a large-capacity super battery handle fitted with rheostat to control the intensity of the light, latest May electric ophthalmoscopic, electric auriscope with three different sizes of specula all blackened inside to

prevent glare, an expanding nasal speculum, a curved laryngeal rod with lamp, throat, and post-nasal mirrors (which can be sterilized), a metal tongue spatula, a holder to take wood tongue blades, and a spare bulb. All instruments are chromium plated. This useful set is presented in a neat and attractive case. Available from all surgical instrument houses in Great Britain and the Dominions. (John Smith & Son (Glas.) Ltd., 28, Gibson Street, Hillhead, Glasgow, W.2.)



*Fig. 94.*

**Electric Midwifery Sterilizer** (*Fig. 95*).—The 'Thermasept' electric instrument sterilizer is British-made throughout. It is made of heavy gauge copper and brazed



*Fig. 95*

seams and supplied with re-set automatic cut-out device, nickel-plated finish, and is suitable for A.C. or D.C. supply. Size 16 x 4 x 3½ in. These sterilizers can also be supplied in other sizes and at most reasonable prices. (Chas. F. Thackray Ltd., Park Street, Leeds, and 252, Regent Street, London, W.1.)

**Electric Sterilizer.**—New design, made of stainless steel throughout, welded together, fitted with a new type of heater which will not burn out even if the sterilizer is allowed to become empty of water. (Allen & Hanburys Ltd., Bethnal Green, London, E. 2.)

**Electrical Treatment Table (Fig. 96).**—When direct current mains were general, the so-called 'Universal' machine provided the only means of obtaining an 'earth-free' current. 'Universal' machines, however, have many disadvantages which have become more apparent with the increasing use of alternating current. The 'Sunic' Metal Rectifier Treatment Table offers a welcome alternative to the 'Universal' machine. It has no moving parts, and nothing to get out of order, yet provides any desired combination of galvanic, faradic, and sinusoidal currents. It is contained in a handsome mahogany cabinet. (Watson & Sons (Electro-Medical) Limited, Sunic House, Parker Street, Kingsway, W.C.2.)

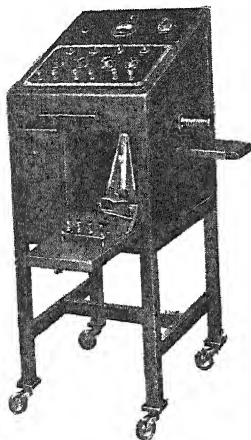


Fig. 96.

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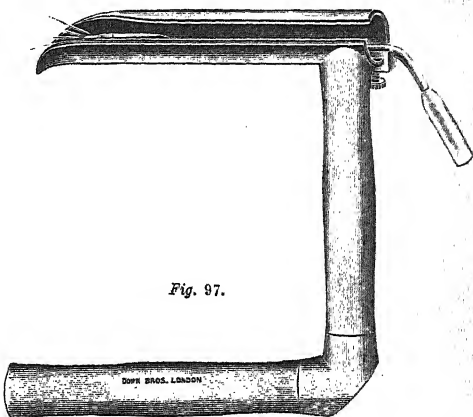


Fig. 97.

**Endotracheal Insufflator.** — Figs. 97, 98 show the apparatus for intra-tracheal insufflation of an  $O_2$ - $CO_2$  mixture in asphyxia neonatorum (*Lancet*, March 30, 1935, (p. 736). The direct vision pharyngoscope (Fig. 97) is a modification of Howarth's Chevalier Jackson's instrument which has been designed for use in the new-born

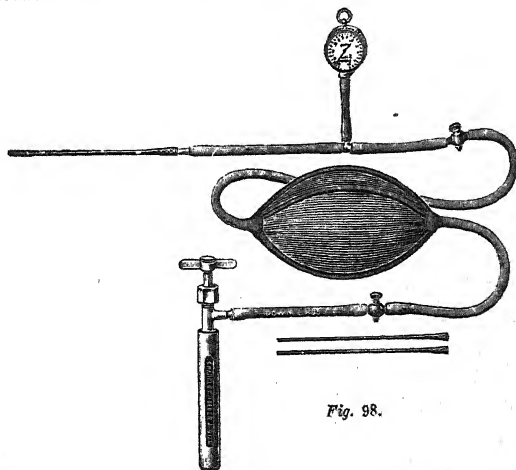


Fig. 98.

infant. The apparatus for delivering the mixture is shown in Fig. 98. For full details see *The Lancet* for July 20, 1935. (Down Bros. Ltd., 21 & 23 St. Thomas's St., London, S.E.1.)

**Eye Magnet.**—This instrument (*Fig. 99*) is a magnet in the form of a probe, pointed at one end for recovering particles of iron or steel from the eye or skin, and flattened at the other end for use in cuts and open wounds. It is highly magnetized and will not

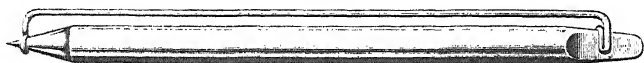


Fig. 99.

lose its 'pull' though sterilized daily. The wire gallery is provided for placing in position when out of use to retain full magnetism. Price, chromium-plated in velvet-lined case, 22s. 6d. (R. Sumner & Co. Ltd., 40, Hanover Street, Liverpool.)

**Fascioplasty Forceps.**—Mr. Ernest Cowell's fascioplasty forceps (*Fig. 100*) are intended for use with the short fascial strip recommended by him. By this method much time is saved on large ventral hernias, since no needles need be used for the fascial strip. The

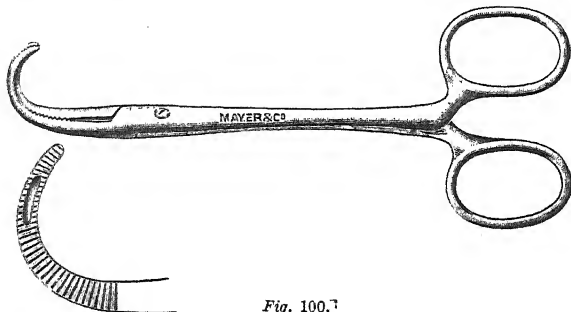


Fig. 100.

forceps are curved and made to push through the tissue under suture, grasping the free end without unduly crushing it. (Mayer & Phelps, Ltd., Chiron House, 59-61, New Cavendish Street, London, W.1.)

**Forceps for Establishing Abdominal Drainage by Counterincision** (*Fig. 101*).—Professor Henry writes: "Messrs. Thackray, of Leeds, have made for me a special forceps

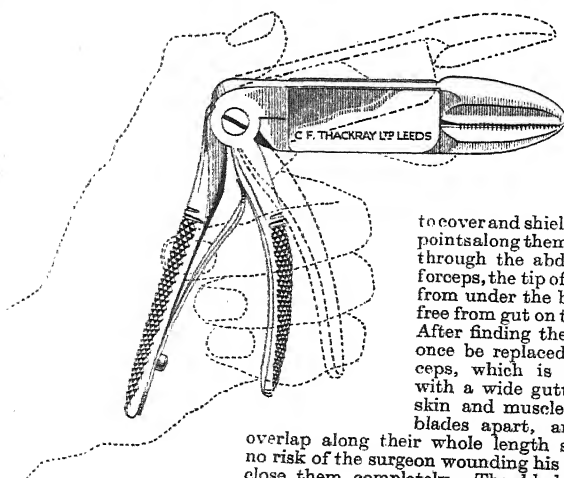


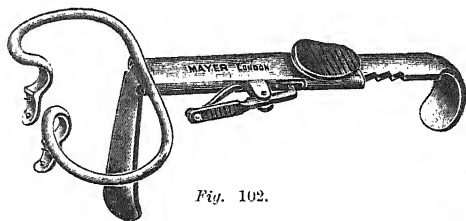
Fig. 101.

that serves—like a pistol—for either hand. The large 'butt' formed by the handles lies comfortably in the palm and does not project; the blades, representing the barrel, make an obtuse angle with the 'butt', and are wide enough when closed

to cover and shield the index finger which points along them. Before cutting down through the abdominal wall on to the forceps, the tip of the index is slipped out from under the blades to feel for a spot free from gut on the parietal peritoneum. After finding the spot the finger can at once be replaced by the end of the forceps, which is grooved for the knife with a wide gutter, easily felt through skin and muscle. A spring keeps the blades apart, and when closed they overlap along their whole length so that there shall be no risk of the surgeon wounding his finger if he neglects to close them completely. The blades will not gape until the abdominal opening from which they emerge is large enough to admit a drain of average diameter." (Chas. F. Thackray Ltd., Park Street, Leeds, and 252, Regent St., W.1.)

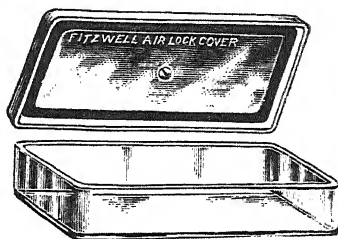
**Gag.**—Newkirk's gag for infants from birth up to 3 or 4 years of age, especially useful for cleft-palate cases (*Fig. 102*). The gag is a modification of the Boyle-Davis instrument. The inner jaws are fitted with spikes to engage the gums, while the outer parts

are grooved to take the lip. The tongue is held out of the way, the centre field is well exposed, allowing the operator to dissect well up to the anterior part of the cleft. Mayer & Phelps, Ltd., Chiron House, 59-61, New Cavendish St., London, W.1.)



*Fig. 102.*

**Glass Trays and Boxes** (*Fig. 103*).—Fitted with Fitzwell's Air-lock chrome-plated metal covers with india-rubber flanges. These improved trays retard evaporation of volatile sterilizing fluids, thus maintaining contents in a sterilized condition. Trays,  $6 \times 3 \times 1\frac{1}{2}$  in., 11s. 3d. each;  $8 \times 4 \times 2$  in., 15s. each. Boxes,  $6 \times 3 \times 3$  in., 12s. each;  $8 \times 4 \times 4$  in., 16s. each. (R. Sumner & Co. Ltd., 40, Hanover Street, Liverpool.)



*Fig. 103.*

**Headlight.**—The new Klinostik Instant-Focus Multipurpose Headlight (*Fig. 104*) has many new features. It is fitted with an optical lens and gives focus range from



*Fig. 104.*

spot to large field. The lamp, which is mounted on the ball-and-socket principle, can be rotated through any angle and projects a sharp field of light without shadows. It should prove most useful to the general practitioner, aurist, or gynaecologist, and for V.D. or other routine clinical work which requires shadow-free illumination. It can be purchased from any surgical instrument house in Great Britain and the Dominions. Price, 27s. 6d. (John Smith & Son (Glas.) Ltd., 28, Gibson Street, Hillhead, Glasgow, W.2.)

**Head-lamp Attachment.**—Messrs. F. Davidson & Co. have made, at the suggestion of Lieut.-Colonel A. M. Dick, I.M.S., a little magnifying stereoscope attachment (*Fig. 105*) for use in conjunction with their special 'Davon' aural head lamps. This attachment is being found very useful by presbyopes, and also for delicate operations. It is focused simply by sliding along the barrel of the outer condenser of the head lamp. Price, 15s. (F. Davidson & Co., 143-149, Great Portland Street, London, W.1.)

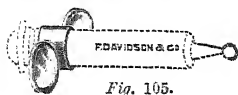


Fig. 105.

**Hot-water Bottle.**—The 'Vitatherm' new process Latex hot-water bottle has a number of advantages over the ordinary fabric bottles. Boiling water can be used without harming the rubber. The surface of the 'Vitatherm' bottle has thermal properties which dissipate the heat slowly over a long period, and the bottle therefore keeps warm longer than any other type of bottle. When the water in the bottle has finally cooled, the surface of the bottle still feels warm to the touch. It is seamless and is guaranteed for two years. Made in one size only, 11 x 8 in., in red colour. Price, 2s. 11d. each. Manufactured by Veedip Ltd., Slough, England. (Chas. F. Thackray Ltd., Park Street, Leeds, and 252, Regent Street, London, W.1.)

**Hypodermic Pocket-case** (*Fig. 106*).—The No. 65 'Hypoloid' Hypodermic Pocket-case will be found convenient to carry and serviceable in ordinary routine or in emergencies. The case measures  $5\frac{1}{2} \times 3\frac{1}{2} \times 1$  in., contains an 'Agle' three-piece syringe in spirit-tight container (min. 20/1 c.c.), an 'Agle' needle, one empty glass-stoppered

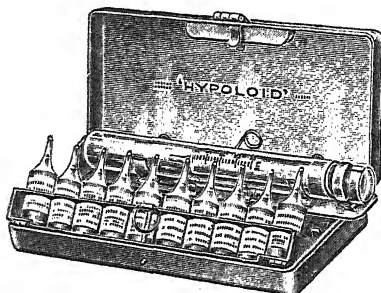


Fig. 106.

bottle for ethyl alcohol, a similar bottle for distilled water, 11 'Hypoloid' products, and 8 tubes of 'Tabloid' hypodermic products. These 'Hypoloid' and 'Tabloid' hypodermic products may be varied according to the requirements of the medical man. The case is of nickel-plated metal. (Burroughs, Wellcome & Co., Snow Hill Buildings, London, E.C.1.)

**Hypodermic Syringe.**—This new all-glass (green) hypodermic and serum syringe (*Fig. 107*) is made of hard glass and therefore is almost unbreakable while being sterilized, and it is unaffected by any liquid. Although only slightly dearer than the

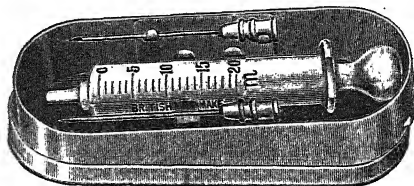


Fig. 107.

ordinary glass syringe, it is much more durable and has many advantages over the Record pattern, being less breakable and cheaper. Complete with two needles in metal case: 1 c.c., 20 m., 3s.; 2 c.c., 3s. 6d.; 5 c.c., 5s.; 10 c.c., 7s. 6d.; 20 c.c., 10s. 6d. (Reynolds & Branson Ltd., 13, Briggate, Leeds, 1.)

**Insulin Pocket-case No. 46** ('Wellcome' Brand) (*Fig. 108*).—A serviceable, compact outfit specially designed to fit into the pocket; measurements:  $3\frac{1}{2} \times 1\frac{1}{2} \times 1$  in. The case contains the materials and apparatus necessary for the administration of insulin and is specially useful when injections are to be self-administered. The contents are as follows: (1) 'Agla' insulin syringe (1 c.c. graduated in  $\frac{1}{20}$  ths). (2) 'Agla' surgical needle (rustless steel), in glass-stoppered container. The container is intended for ethyl alcohol, in which the needle will be immersed, thus maintaining it in an aseptic condition. (3) 5-c.c. rubber-capped phial of 'Wellcome' Brand insulin, containing 100 units. (4) 'Vaporole' iodine applicator for use when sterilizing the skin at the site of injection and the rubber-cap on the insulin phial prior to removal of a dose. The case is made of nickel-plated metal with a highly polished exterior. Price to the medical profession, 22s. 6d. (Burroughs Wellcome & Co., Snow Hill Buildings, London, E.C.1.)

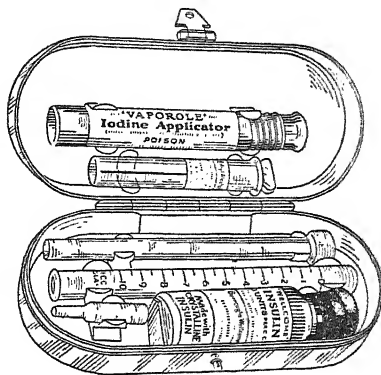


Fig. 108.

**Interchangeable Suction Tubes with Universal Handle** (*Fig. 109*).—These fulfil a long-felt want. Each tube fits the one handle. Plug fitting. Chromium-plated finish.

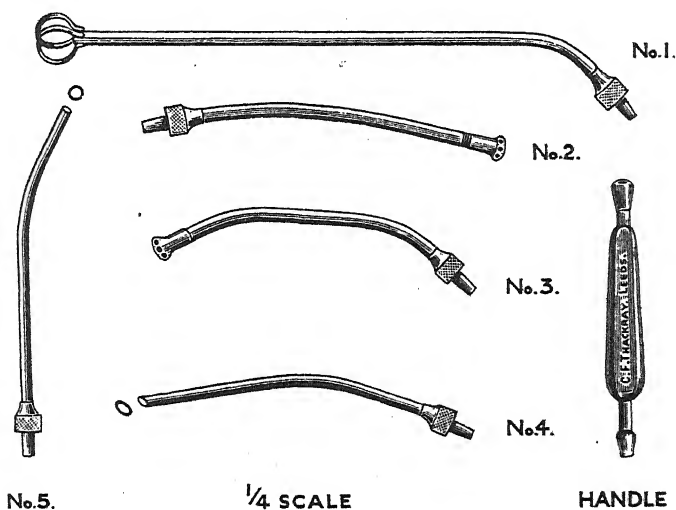
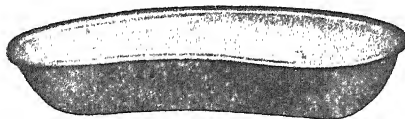


Fig. 109.

- No. 1. Abdominal tube with loop end, 11 in. long.
- No. 2. Malleable tube with nozzle end,  $7\frac{1}{2}$  in. long.
- No. 3. Yankauer's tube with nozzle end, 6 in. long.
- No. 4. Bent tube with oval section end,  $6\frac{1}{2}$  in. long.
- No. 5. Bent tube with small round section end, 6 in. long.

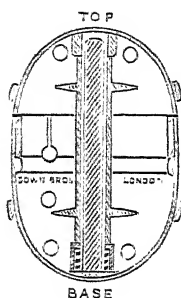
Tubes 2, 3, 4, and 5 are especially useful for ear, nose, and throat work. Complete set consisting of 5 tubes and handle. (Chas. F. Thackray Ltd., Park Street, Leeds, and 252, Regent Street, London, W.1.)

**Kidney Dish.**—The kidney dish illustrated in *Fig. 110* is made of black bakelite. It is sterilizable and practically unbreakable. Owing to the colour, blood is inconspicuous in these trays. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

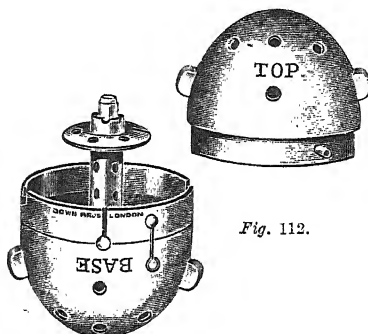


*Fig. 110.*

**Ligature Egg (Figs. 111, 112).**—Mr. Harold Dodd writes: "Down Brothers have made an egg for me . . . Robust in construction, its disassembling and loading, even when wet, are easy by reason of external knobs which also prevent it from rolling about. A distance piece checks the reel sliding up and down and unwinding, and the central spindle allows free access of water to the inside of the strong, liberally perforated reel, thus



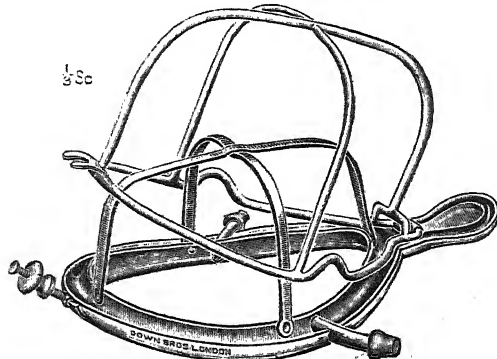
*Fig. 111.*



*Fig. 112.*

ensuring sterilization of all ligature material on it. The ligature is brought out through a small slot in the side and is hitched to a spring clip until it is required for use. The words top and base are clearly engraved on the egg, so minimizing the possibility of the reel falling out by opening the egg upside down." (Down Bros. Ltd., 21 & 23, St. Thomas's Street, London, S.E.1.)

**Madan's Double Mask.**—The mask shown in *Fig. 113* is a modification by Dr. K. E. Madan, Anaesthetist, Mayo Hospital, Lahore, of Schimmelbusch's model with a superimposed cage. In use ether is dropped on the gauze and lint and a small towel put on



*Fig. 113.*

the outer cage without touching the gauze or lint, thus forming a closed ether chamber and preventing waste. (Down Bros. Ltd., 21 & 23, St. Thomas's Street, London, S.E.1.)



**Mastoid Gouge and Mallet.**—*Fig. 114* shows a gouge designed by Mr. Geoffrey Carte, F.R.C.S. These gouges are by no means a new invention. The pattern is a simple modification of the tools used by sculptors. For some 4000 years the sculptor has been using a hammer and chisel or gouge as instruments of precision. The spindle-shaped octagonal grip and the small concavity in the haft are taken from a sculptor's



Fig. 114.

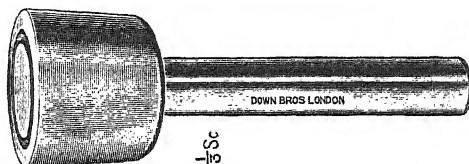


Fig. 115.

studio. The grip cannot slip—the concavity adds touch through the hammer. The mallet also is of the sculptor's pattern—round-faced (*Fig. 115*). It is made of zinc. The sculptor uses different materials for his hammer according to the hardness of the substance carved. This metal is used in the hammer for cutting stone of moderate density, and has been used here as the consistency of the bone met with in the average mastoid operation is much the same. (Down Bros. Ltd., 21 & 23, St. Thomas's Street, London, S.E.1.)

**Medical Torch.**—The new Klinostik Rheostat Pen Torch (*Fig. 116*) has met with immediate success. It is essentially a medical torch and guaranteed to stand up to continual use. It is made without joints and the heavy gauge material ensures strength.



Fig. 116.

It is the strongest torch of its type, and is also the only pen torch to employ a rheostat to control the intensity of the light—a decided advantage. The price is 5s., and it can be had from all surgical instrument houses in Great Britain and the Dominions. (John Smith & Son (Glas.) Ltd., 28, Gibson Street, Hillhead, Glasgow, W.2.)

**Midwifery Forceps (Wrigley's).**—The forceps shown in *Fig. 117* are conveniently

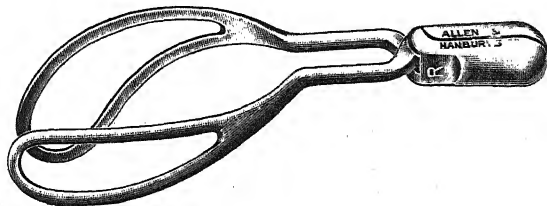


Fig. 117.

short, and weigh under 10 oz. Described by Mr. A. J. Wrigley in *The Lancet*, Sept. 28, 1935. Price, £2 17s. 6d. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

**Nail Drill (Fig. 118).**—This is a useful instrument for releasing the blood from beneath a nail that has been injured by a blow, thus preventing coagulum from

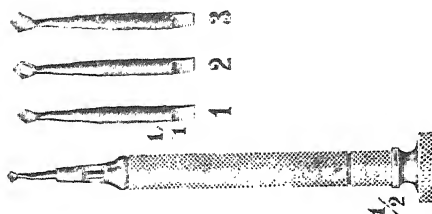


Fig. 118.

forming and an unsightly nail until a new one has grown. Price, chrome-plated, including three drills, 11s. 6d. each. (R. Sumner & Co. Ltd., 40, Hanover Street, Liverpool.)

**Nasal Bougie (Fig. 119).**—Mr. A. R. Friel, M.D., F.R.C.S., writes: "A great step forward in the treatment of catarrhal and congestive conditions of the nose was made by Dr. Gautier, of Paris, by the treatment for congestive rhinitis which he calls 'diastolization'. This is simple and can be carried out at home by the mother, or in the clinic by the nurse. A special curved, soft rubber hollow bougie is passed into the nose along its floor between the inferior turbinal and the septum. The gentle stimulus causes, by reflex action, the vessels of the inferior turbinal to contract and the glands to express their secretion. The turbinal shrinks and the child can blow its nose freely and breathe through it again. The congestion of the nasopharynx,

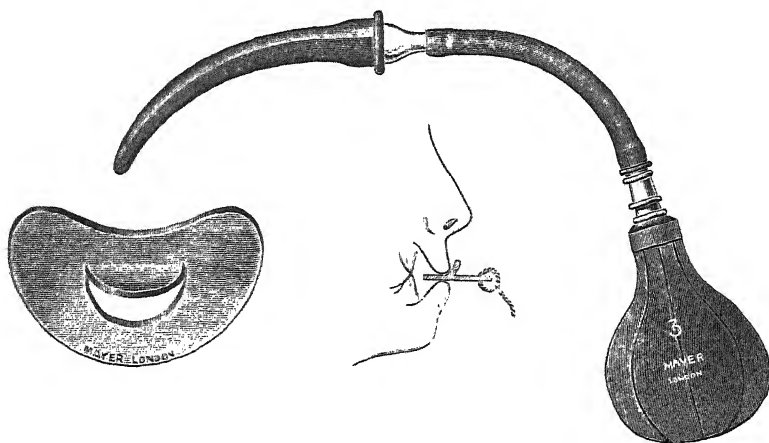


Fig. 119.

Eustachian tube, and the middle ear also disappears. Before the bougie is used it is dipped in warm water, and it is allowed to stay in the nose three minutes or more. Both sides can be treated at the same time. The key to the prevention of otitis media in children is the Eustachian tube, and the key to the Eustachian tube is usually the nose. Treatment by diastolization will also obviate many an operation for adenoids. After the rhinitis has been cured some children still keep their lips apart. Dr. Sheldon Friel devised a small disc for these children to hold with their lips as shown in the illustration. It should be worn for at least an hour daily. Where there is no nasal obstruction it helps to break a bad habit by giving the lips something to do." (Mayer & Phelps Ltd., Chiron House, 59-61, New Cavendish Street, London, W.1.)

**Nasal Ionization.**—The apparatus illustrated in *Fig. 120* was designed by Mr. Arthur Miller, F.R.C.S., for nasal ionization. It consists of a spectacle frame to which are attached two nasal electrodes. It rests on the bridge of the nose, being applied by the patient himself, and is much more comfortable than that fitted with headband. The terminals are in a line with the nostrils and are fixed in position after their introduction into the nose; a precise and easier method, and one which causes the patient the least discomfort. (Mayer & Phelps Ltd., Chiron House, 59-61, New Cavendish Street, London, W.1.)

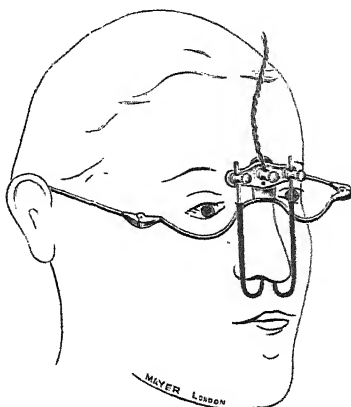


Fig. 120.

**Negative and Positive Pressure Pump.**—This is an improved and portable model of Mennell's pump. Complete with electrically driven pump and universal motor in carrying case. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

**Ophthalmoscope.**—A wide-angle ophthalmoscope has now been produced having all the advantages of its more expensive contemporaries but only costing £5 5s. Theoretically the general practitioner requires a better instrument than the ophthalmic surgeon, as the former does not have time to dilate the pupil when wishing to make a routine examination of the fundus. This wide-angle ophthalmoscope, for direct examination only, gives exactly the same results as the more expensive models, but is well within reach of the average pocket. (C. Davis Keeler, 47, Wigmore Street, London, W.1.)

**Obstetric Bag.**—*Fig. 121* shows a new design of obstetric bag completely fitted. The instruments required for abnormal labour are kept sterilized in a separate compartment

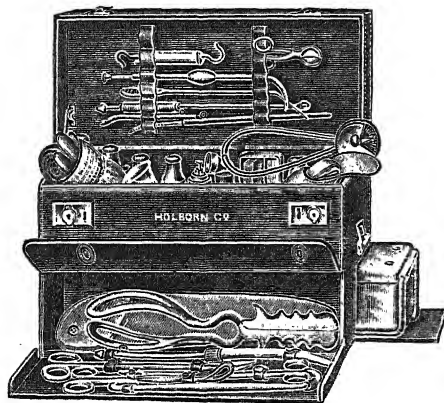


Fig. 121.

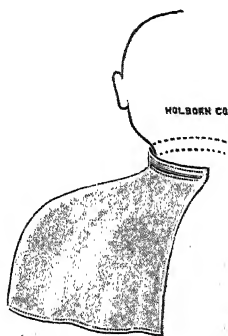
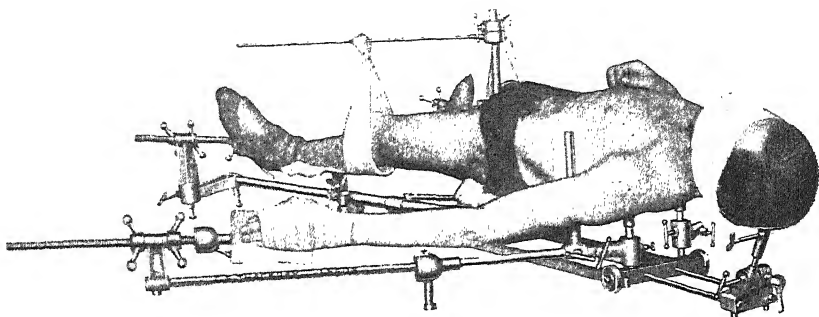


Fig. 122.

so that they need not be disturbed for the average case. Full particulars of the contents will be gladly sent on application. In smooth brown hide, 18 x 8 x 11 in. high. (The Holborn Surgical Instrument Co. Ltd., 26, Thavies Inn, London, E.C.1.)

**Oiled-silk Cape** with spring to clip round neck, protecting patients' clothing whilst syringing the ear (*Fig. 122*). British make, 3s. 6d. (The Holborn Surgical Instrument Co. Ltd., 26, Thavies Inn, London, E.C.1.)

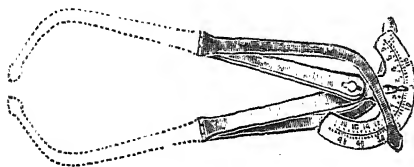
**Orthopaedic Apparatus.**—The apparatus illustrated in *Fig. 123* was made to the specifications of Mr. A. G. Ord, F.R.C.S., Portsmouth: a full description appeared in *The Lancet*, 1935, May 25. It is an entirely portable apparatus which is stored in a box measuring  $37 \times 21 \times 11\frac{1}{2}$  in., and having a total weight, when packed, of 100 lb. only. Among its special features are: (1) Facility to take X-ray pictures of the limbs when the patient is *in situ* on the apparatus; (2) Improved type of body support,



*Fig. 123.*

anatomically shaped to the contour of the shoulders and permitting application of spica plasters; (3) New design head support which can be raised or lowered; (4) An entirely new arm extension fitting which allows treatment of fractures of the humerus or forearm. All the normal positions required in orthopaedic practice can be quickly obtained. (Chas. F. Thackray Ltd., Park Street, Leeds, and 252, Regent Street, London, W.1.)

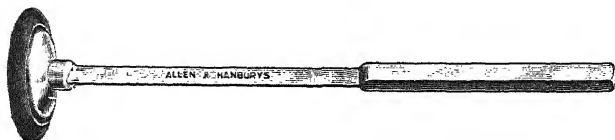
**Pelvimeter.**—The fold-over jointed pelvimeter illustrated in *Fig. 124* is graduated with English and metric scales for internal and external measurements; it is portable



*Fig. 124.*

and can be conveniently carried in the coat pocket. Price complete in jean pouch, 2s. 9d. (R. Sumner & Co. Ltd., 40, Hanover Street, Liverpool.)

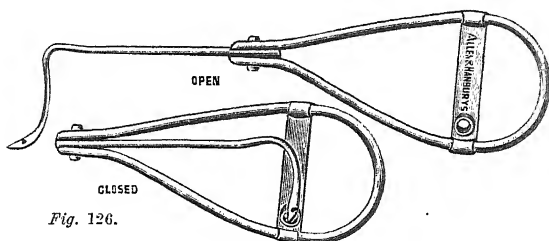
**Percussor** (*Fig. 125*).—Made entirely of metal with the exception of the india-rubber



*Fig. 125.*

ring. Has a spring shaft with weighted head. Price, 6s. (Allen & Hanbury Ltd. Bethnal Green, London, E.2.)

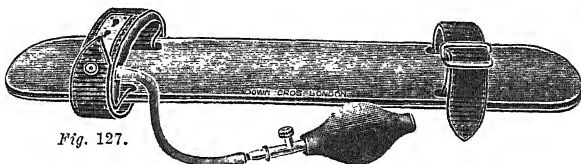
**Perineum Needle (Folding)** (*Fig. 126*).—Stainless steel. Most convenient pattern for the general practitioner, as when folded the point is protected, and it can be carried



*Fig. 126.*

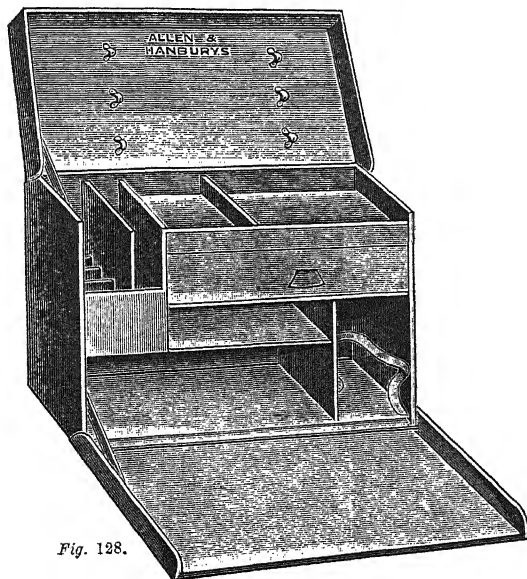
loose in the bag without damage to itself or to other articles. Price, 10s. 6d. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

**Pneumatic Tourniquet for Evipan Injection.**—The apparatus shown in *Fig. 127* was designed by Mr. A. Dickson Wright, and was described in an article by him which appeared in *The Lancet* for May 4, 1935, to which reference should be made for a full account of his technique and the apparatus used by him. (Down Bros. Ltd., 21 & 23, St. Thomas's Street, London, S.E.1.)



*Fig. 127.*

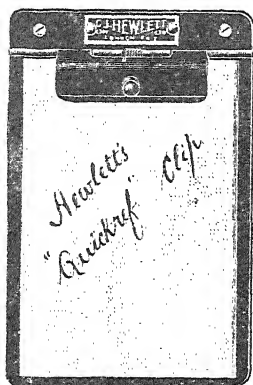
**Portable Attaché Case (Dr. Toop's).**—Size  $18\frac{1}{2} \times 8 \times 12\frac{1}{2}$  in., with drawer for dressings, compartments for sphygmomanometer, diagnostic outfit, hypodermic set,



*Fig. 128.*

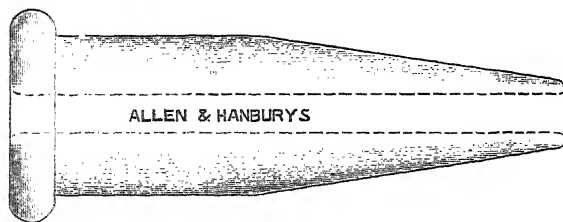
instruments in spirit-proof case, etc., with fall front containing pockets for papers, and hinged lid (*Fig. 128*). (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

'Quickref' Clip (*Fig. 129*).—This novel device is a useful accessory for the busy practitioner's motor-car. It is intended to hold a number of sheets of paper for notes, list of calls or requirements, etc., in a position convenient for instant reference, and can be attached to any suitable place in the car. The clip is hinged and provided with



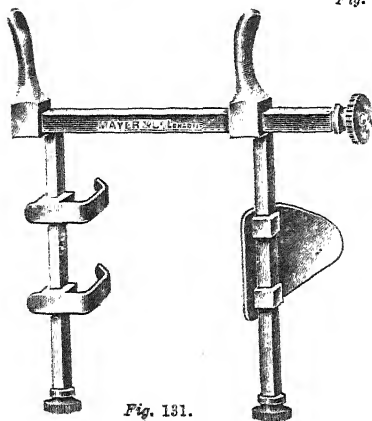
*Fig. 129.*

a stiff metal plate, size  $6\frac{1}{2} \times 4\frac{1}{2}$  in., so that notes may be made on the list without removing from the clip. The clip is made of black japanned steel, and is sold complete with screws and bolts suitable for attachment to either wood or metal. (C. J. Hewlett & Son, Ltd., 35-42, Charlotte Street, London, E.C.2.)



*Fig. 130.*

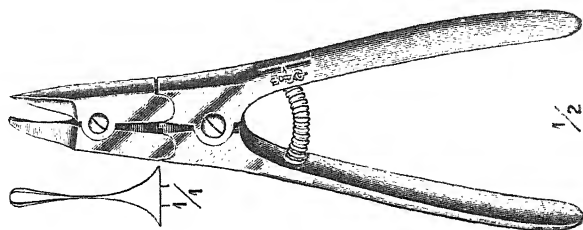
**Rectal Bougie.**—Hurst's conical vulcanite rectal bougie (*Fig. 130*) is made with a central hole and flange. Length  $4\frac{1}{2}$  in., maximum diameter  $1\frac{1}{2}$  in. For the treatment of anal achalasia. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)



*Fig. 131.*

**Retractor** (*Fig. 131*).—This retractor for the external frontal sinus and ethmoidal operation, made for Mr. Gilbert Howells, F.R.C.S., has proved most satisfactory in use. The broad, curved blade slips in under the orbital periosteum and retracts the orbital contents without any danger of damaging the eyeball. The two small hooks on the opposite arm slip under the integuments, and, owing to their mobility on the arm, will adapt themselves to the curve of the incision. (Mayer & Phelps Ltd., Chiron House, 59-61, New Cavendish Street, London, W.1.)

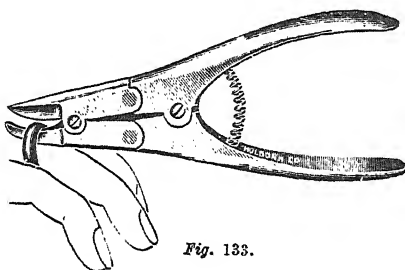
**Ring-cutting Forceps.**—The instrument illustrated in *Fig. 132* is a great improvement in the method of removing rings from fingers, the compound action joint being very forceful. The lower jaw is blunt and slides easily under the ring without injury to the finger.



*Fig. 132.*

Price, chromium-plated, 22s. 6d. each. (R. Sumner & Co. Ltd., 40, Hanover Street, Liverpool.)

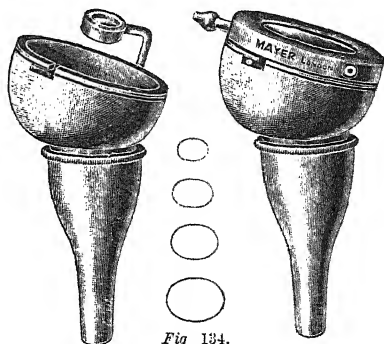
**Ring-cutting Pliers** (*Fig. 133*) for removing rings from swollen finger, very powerful,



*Fig. 133.*

with compound joint, nickel-plated. (The Holborn Surgical Instrument Co. Ltd., 26, Thavies Inn, London, E.C.1.)

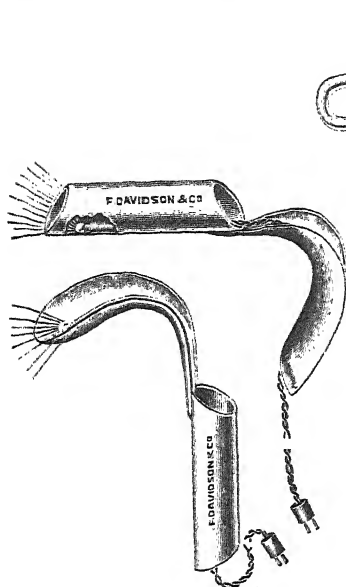
**Speculum (Aural)** (*Fig. 134*).—This modification of Peter's pneumatic speculum has an opening in the upper part to facilitate rarefaction of air inside the ear. The procedure is as follows: The speculum having been placed in the ear, the rubber bulb attached to the speculum is pressed with the right hand and completely emptied of air, the latter escaping through the opening. The opening is next closed with the index finger of the left hand, the bulb is released, and the air thus drawn from the ear into the bulb; during this process discharge is coaxed from the middle ear into the meatus. A very powerful suction is obtained in this way; 'sticky discharge' of Eustachian or attic origin is easily drawn into the meatus. The speculum will be found particularly useful in preparing the ear for ionization. A lens is supplied so that the instrument can be used for myringotomy, removing wax, and other similar procedures. This speculum was made for Mr. Arthur Miller, F.R.C.S. Edin. (Mayer & Phelps, Limited, Chiron House, 59-61, New Cavendish Street, London, W.1.)



*Fig. 134.*

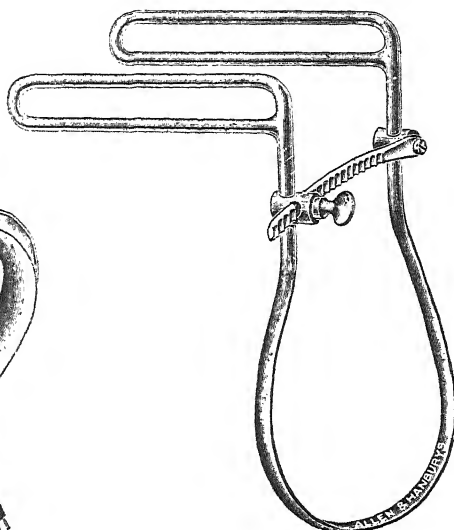
**Shadowless Lamps.**—Messrs. Kelvin Bottomley and Baird, Ltd. (18, Cambridge Street, Glasgow, C.2) report that there have been no serious alterations in their well-known shadowless lamps during 1935: but small improvements in the details of design are continually being made in order that the lamps may be kept up to date. A very wide range is available to suit all purposes. The manufacturers will be pleased to send illustrated pamphlets containing full details.

**Speculum (Vaginal)** (*Fig. 135*).—The 'Davon' self-illuminated, sterilizable, Sims-Fergusson vaginal speculum. Two complete lamps with fittings, each with washable



*Fig. 135.*

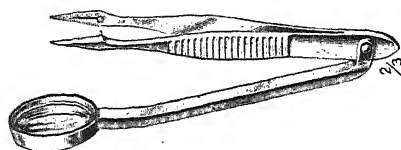
*rubber flex.* are supplied. Either speculum can be illuminated at will. (F. Davidson & Co., 143-149, Great Portland Street, London, W.1.)



*Fig. 136.*

**Speculum (River's Vaginal).**—*Fig. 136* shows a vaginal speculum with long narrow fenestrated blades and adjustable rack. It is easily introduced and gives good inspection without discomfort to the patient. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

**Splinter Forceps with Magnifier** (*Fig. 137*).—This novel appliance has been very favourably received, as it magnifies the area containing the foreign body, thus



*Fig. 137.*

facilitating its removal. Price, chrome-plated, 6s. 6d. each. (R. Sumner & Co. Ltd., 40, Hanover Street, Liverpool.)



**Stethoscope.**—The 'Davon' All-metal Stethoscope (*Fig. 138*) has pliable metal tubes which enable it to convey sound very clearly. The tubes transmit the sound waves without hindrance and give rise to practically no secondary noises despite their

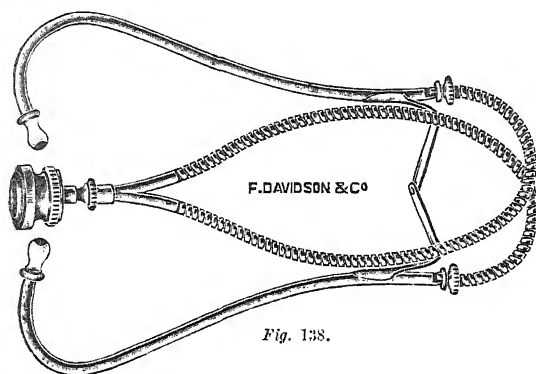


Fig. 138.



Fig. 139.

extreme sensitiveness. The 'Davon' Fœtal Heart Attachment (*Fig. 139*) can be supplied interchangeable with the phonendoscope chest-piece. (F. Davidson & Co., 143-149, Great Portland Street, London, W.1.)

**Stirrup.**—*Fig. 140* shows a modified Kirschner's Stirrup, for extension wires in operative treatment of fractures, adjustable for size and for straining the wire, chromium-plated, with spanner. Two sizes, for adults and children. (The Holborn Surgical Instrument Co. Ltd., 26, Thavies Inn, London, E.C.1.)

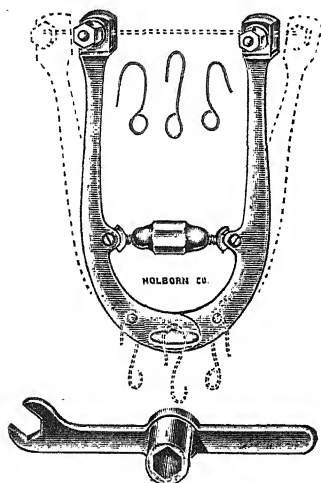


Fig. 140.



Fig. 141.

**Suction Bottle ('The Safety')** (*Fig. 141*).—This has been designed for use with the 'Aqua-Vac' Suction Valve (*see p. 572*). It is fitted with a float valve arranged to close automatically when aspirated fluid reaches a high level. This prevents the possibility of pus or other undesirable fluids entering the suction valve and contaminating it. In use it is interposed between the valve and suction tube. All metal parts are chromium-plated. Capacity approximately  $\frac{1}{2}$  gallon. (Chas. F. Thackray Ltd., Park Street, Leeds, and 252, Regent Street, London, W.1.)

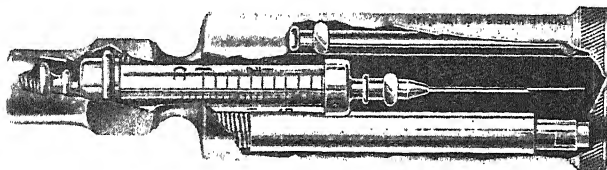
**Swann-Morton Scalpels and Blades** (*Fig. 142*)—Standard fitting and interchangeable with all B.P. type blades and handles. They have the following special advantages: The steel used in the blade is stiffer and more rigid than any hitherto utilized and gives a solidity of feel which is appreciated by the surgeon. This rigidity is achieved without



*Fig. 142.*

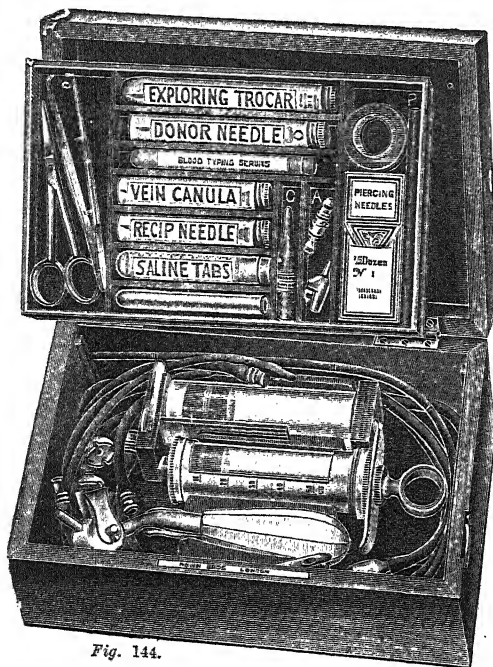
any ribs or other protrusions. The flexion of the blade on the Swann-Morton fitment is a further refinement and gives greater strength to the locking action. Other refinements are the specially designed grip, giving perfect poise and balance, and the treatment of the handles by a special process which gives glass-hard and stainless finish. This eliminates handle wear and enables blades to be slipped off and on with greater ease. (W. R. Swann & Co. Ltd., 92-94, Bradfield Road, Sheffield, 6.)

**Syringe.**—The 'Harris' new pattern syringe and tablet case (*Fig. 143*) is a useful



*Fig. 143.*

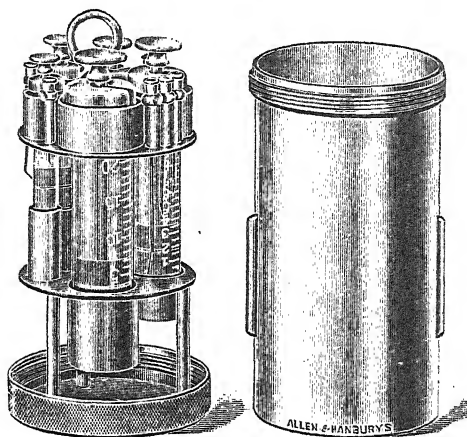
outfit, consisting of a 1 c.c./20 mm. 'Record' syringe, with needle in position ready for use, carried in a nickel-plated washerless spirit-proof container with a compartment at the base end to accommodate fineglass hypodermic tablet tubes and two spare needles. (Philip Harris & Co. (1913) Ltd., Edmund Street, Birmingham, 3.)



*Fig. 144.*

**Syringe Outfit.**—Mr. H. Dodd, in the *Practitioner*, September, 1935, describes an efficient outfit, consisting of a three-way syringe with numerous accessories conveniently mounted in a small wooden case. The outfit as shown in *Fig. 144* is claimed by Mr. Dodd to be one which is always ready for use in emergencies, such as blood transfusion, aspiration of abscess, gastric analysis, stomach wash-out. If a barrel of the syringe is broken a new one can be supplied, and in the outfit are included all the necessary fittings for blood tests, preparing saline or citrate solutions, etc. The contents can be modified at any time to suit particular requirements. (Down Bros. 21 & 23, St. Thomas's Street, London, S.E.1.)

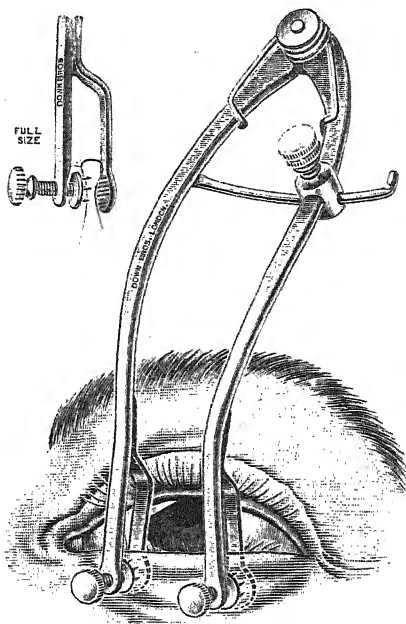
**Syringes in Spirit-proof Case.**—This chromium-plated metal case, size 6 in. high by  $3\frac{1}{2}$  in. diameter (*Fig. 145*), has a screw-on cover with cone fitting to ensure that the spirit with which the case should be filled does not leak. The case is fitted with



*Fig. 145.*

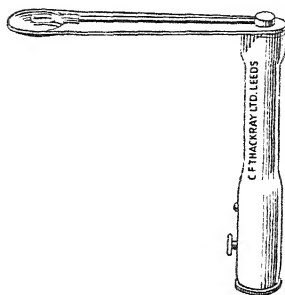
a rack carrying five 'Record' syringes, of 1, 2, 5, 10, and 20 c.c. capacity respectively, and eight stainless steel needles of various sizes. Each syringe is held in a separate compartment with spring to protect the glass barrel and prevent rattling. When the syringes are required, the rack carrying them can be lifted out of the case and stood in the cover to prevent contamination. A special antiseptic spirit that prevents rust should be used for this case. Price £4 10s. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

**Tarsorrhaphy Lid Clamp.**—*Fig. 146* shows a new tarsorrhaphy lid clamp, designed by Mr. T. J. Phillips, of the Royal London Ophthalmic Hospital, as used for the operation of complete or partial tarsorrhaphy at Moorfields. After the lids have been anaesthetized the tarsorrhaphy clamp is placed in position, one arm so that the smooth plate is put under the edge of the lid near the outer canthus and about 3 mm. from the lid margin, and the spiked blade is then screwed down to the lid surface. The other arm is then placed about 3 mm. from the inner canthus and the spiked blade screwed down. The clip is then allowed to spring open so as to stretch the lid margin. The locking clamp is then placed in position, the spiked blades rotate freely on their shaft and so do not tear the skin. The operation is then proceeded with. The accompanying illustrations show to a great extent the operation as performed at Moorfields. (Down Bros. Ltd., 21 & 23, St. Thomas's Street, London, S.E.1.)



*Fig. 146.*

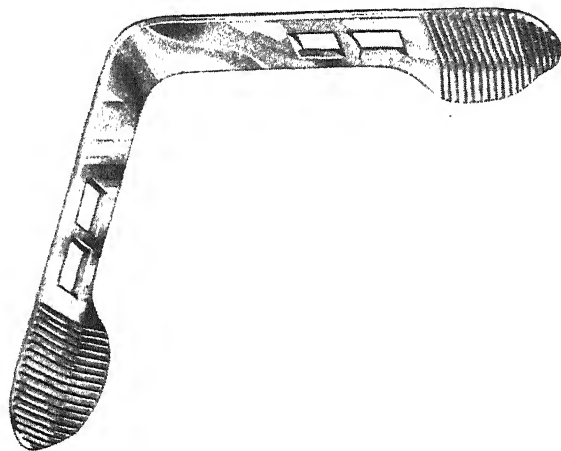
**Throat Lamp** (*Fig. 147*).—This all-metal electric throat lamp has been devised to provide a throat examination lamp which can be sterilized. The metal tongue depressor can be detached from the metal handle, and the lamp and holder are also detachable for sterilizing. If preferred, the lamp and depressor may be immersed for a few seconds



*Fig. 147.*

in boiling water. The dry battery is contained in the hollow handle. The lamp is recessed into a hollow at the end of the spatula, which acts as a reflector, and the lamp is out of the line of vision. A screw button switch is conveniently placed on the handle. Finished in chromium-plating. (Chas. F. Thackray Ltd., Park Street, Leeds, and 252, Regent Street, London, W.1.)

**Tongue Depressor** (*Fig. 148*).—An improved tongue depressor L-shaped, the blades of which have a lateral flap on the one side only, which gives the operator a clear



*Fig. 148.*

view, by holding down the right or left side, of the back of the tongue. It depends on the blade used whether a right or left view is obtained. Price, chromium-plated, 8/6 each. (R. Sumner & Co. Ltd., 40, Hanover Street, Liverpool.)

**Tongue Depressor and Tonsil Evertor**.—Made of solid stainless steel. This is a simple, clean, and efficient instrument for the examination of the mouth and tonsils. Price, 6s. 6d. (Allen & Hanbury Ltd., Bethnal Green, London, E2.)

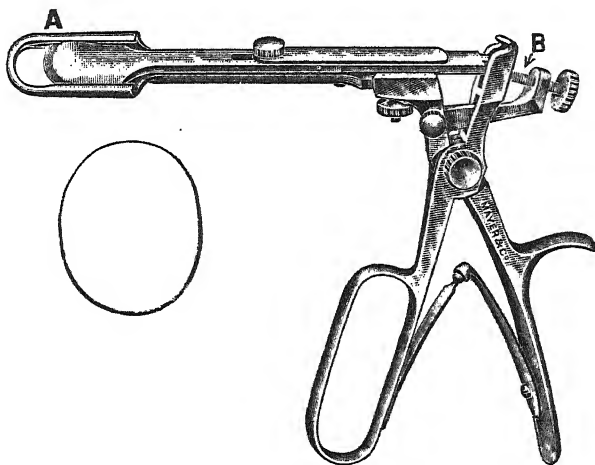
**Tonsil Enucleator.**—Dr. Gwynne-Evans has designed the tonsil enucleator illustrated in *Fig. 149*. The smooth tapered end is slightly curved, with semi-sharp edges, used solely for the purpose of incising the reflected mucous membrane of the tonsil, freeing the anterior pillar, the upper pole, and the posterior pillar in turn, preserving the pillars intact and displaying the capsule. The reversed end is flattened and also slightly curved, terminating in a straight row of very fine serrations, the sides being smooth and semi-sharp. The serrated edge rests on, and is kept close to, the tonsil, and used to



*Fig. 149.*

separate the tonsillar bed gently away from the tonsil. Trauma and subsequent after-pain are reduced to a minimum, as it is impossible to injure the bed of the tonsil, and each movement that is made accomplishes its object. Also, incidentally, the length of anaesthesia is shortened. Haemorrhage rapidly ceases, in most cases without ligaturing, and a smooth tonsillar bed remains. The dissection of tonsils in children is rapid and easy, with freedom from shock and post-operative bleeding. (Mayer & Phelps Ltd., Chiron House, 59-61, New Cavendish Street, London, W.1.)

**Tonsil Guillotine** (*Fig. 150*).—Designed by Mr. Arthur Miller, F.R.C.S. (1) The fenestra is oval and is of sufficient length to permit the longitudinal diameter of the tonsil to be engaged without undue squeezing (any pressure required is produced by the transverse diameter of the ring, with or without adjustment of the blade). This fact makes it difficult for the upper or lower poles to escape from the ring the moment the blade is pushed home. (2) The size of the fenestra A can be regulated by the action of the screw B. This does away with the necessity of employing different blades. It is



*Fig. 150.*

obviously an advantage to be able to adjust the size of the fenestra with the guillotine actually in the patient's mouth. (3) The bevelled edge of the blade prevents the anterior pillar from being drawn into the slot of the head when the blade is driven home. It is a common experience (except when using the reversed guillotine) to find the anterior pillar damaged in spite of a correct application of the guillotine, particularly when dealing with flat or non-pedunculated tonsils. The bevelled blade peels the anterior pillar off the tonsil, folding the former, as it were, on itself. (Mayer & Phelps Ltd., Chiron House, 59-61, New Cavendish Street, London, W.1.)

**Tracheotome (Fig. 151).**—A tracheotome, as used at the Hajek Clinic in Vienna, is intended to obviate the use of a scalpel in tracheotomy. After injecting a little cocaine into the trachea a small transverse incision is made between the second and

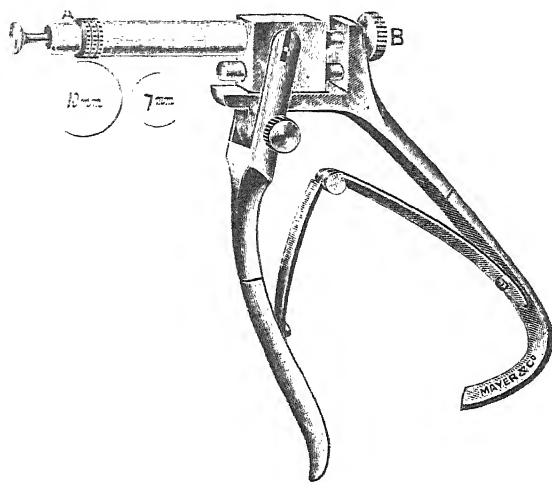


Fig. 151.

third cartilaginous rings sufficiently large to admit the end of the tracheotome, which is made in two sizes. The advantage of this instrument is that a circular aperture is made which allows the cannula to fit accurately in the trachea. (Mayer & Phelps Ltd., Chiron House, 59-61, New Cavendish Street, London, W.1.)

**Transformer for Galvanocauteries and Surgical Lamps.**—This transformer slips easily into the surgeon's case, its size being  $6 \times 3 \times 3$  in. and the weight  $3\frac{1}{2}$  lb. Outlet terminals for the simultaneous use of cautery and light instruments greatly facilitate low voltage cauterization. (Allen & Hanburys Ltd., Bethnal Green, London, E.2.)

**Twin Forceps for Squint Operations (Fig. 152).**—Dr. A. Wynn Green (Wolverhampton) writes: "Twin forceps to be used in the resection or resection-advancement operation on the internal rectus in order to avoid the employment of calipers and rulers have been made for me by Down Bros. Ltd. These forceps are really two Prince's forceps united in such a way that one slides on the other and is readily detachable. The forceps have a 10 mm. scale by which can be made an exact measurement of the

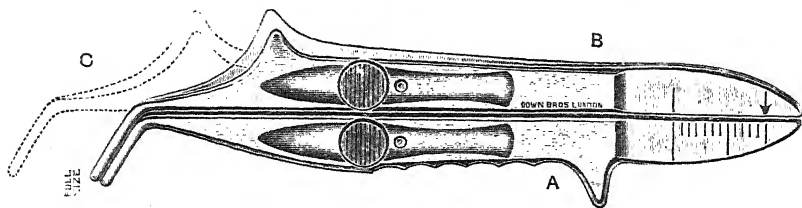


Fig. 152.

length of muscle to be removed. They are applied in the manner of ordinary Prince's forceps, both forceps being clipped to the muscle. Forceps B is then opened, and moved down the scale (see position C). The muscle is now secured between the jaws of forceps B: when the muscle between A and B has been cut away, forceps A is removed and the operation completed in the usual way." (Down Bros. Ltd., 21 & 23, St. Thomas's Street, London, S.E.1.)

**Urethral Bougie (Combination).**—Mr. Harold Dodd, F.R.C.S. (London, W.1) writes : " In a ten-years experience of dilatations of urethral stricture I have found that certain obstructions can only be negotiated by a Lister bougie, whilst to pass others the curve of a Beniqué instrument is necessary. In using the otherwise excellent French bougie the absence of the graduated shaft and of the weighted handle of the Lister pattern was repeatedly felt, and out of this arose the idea of combining the two instruments in one in order to secure the advantages of both. The example illustrated (*Fig. 153*) is one of a graduated set, made for me by Messrs. Down Bros. It has the peculiar curve

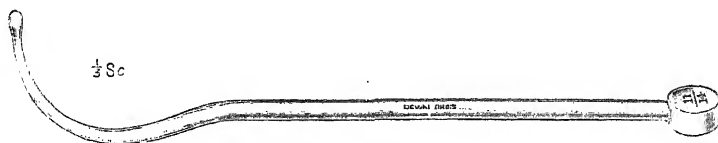


Fig. 153.

of the Beniqué bougie, with the olive-headed tip, neck, tapered shaft, weighted handle, and sizes of the Lister instruments. I have used it regularly for eighteen months and have found that it fulfils its purpose well. It usually 'falls in', the dilatation is gradual, and it is effective in passing a tortuous urethra. In addition, it is very useful for determining the patency of the common bile-duct into the duodenum, and for stretching the ampulla of Vater." (Down Bros. Ltd., 21 & 23, St. Thomas's Street, London, S.E.1.)

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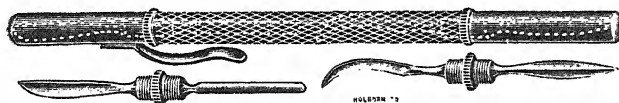


Fig. 154.

and one eye spud, Stainless steel, in hollow handle with protecting caps. (The Holborn Surgical Instrument Co. Ltd., 26, Thavies Inn, London, E.C.1.)

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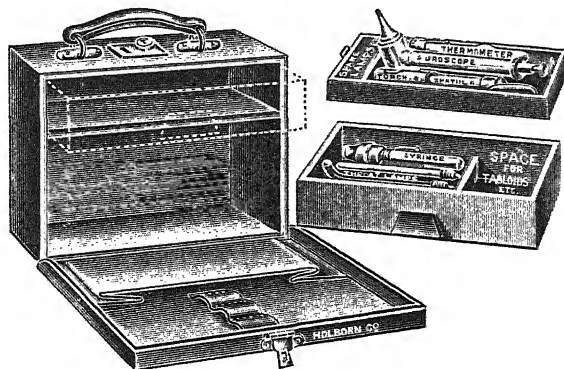


Fig. 155.

all particulars of contents and sizes sent on application. (The Holborn Surgical Instrument Co. Ltd., 26, Thavies Inn, London, E.C.1.)

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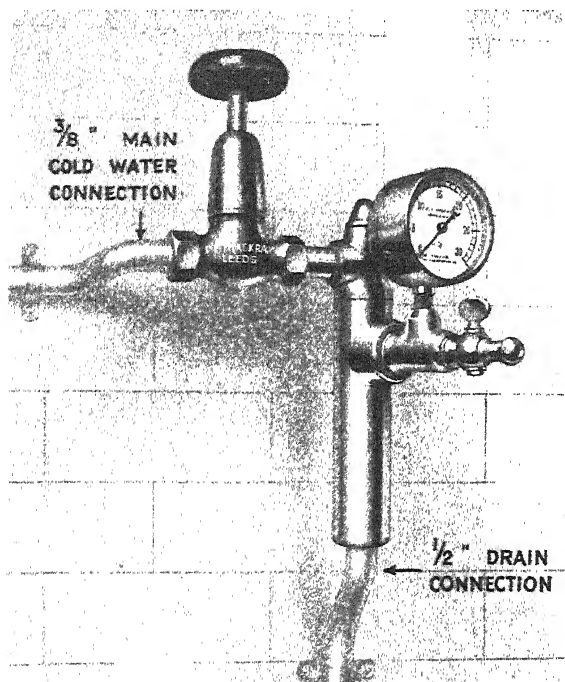


Fig. 156.

cold water supply and drain. It is finished in highly polished chromium plate, and is complete with a vacuum gauge. For use with it, interchangeable suction tubes with universal handle have been designed (see p. 555). (Chas. F. Thackray Ltd., Park Street, Leeds, and 252, Regent Street, London, W.1.)

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*\*Leicestershire and Rutland Mental Hospital, Narborough, near Leicester.* Res. Med. Supt., K. K. Drury, M.C., M.D., D.P.M. Narborough,  $\frac{1}{2}$  mile; Leicester, 6 miles.

## LINCOLNSHIRE.

*Bracebridge Mental Hospital, Lincoln.* Res. Med. Supt., Dr. John Macarthur, D.P.M. Lincoln, L. & N.E.R.,  $\frac{2}{3}$  miles.

*\*Rauceby Mental Hospital, Sleaford.* Res. Med. Supt., N. K. Henderson, B.A., LL.B., M.B., Ch.B., D.P.H., D.P.M. Rauceby, L. & N.E.R.,  $\frac{1}{2}$  mile.

*\*The Lawn Registered Hospital, Lincoln.* Res. Med. Supt., Dr. Myra Mackenzie. Lincoln station, 1 mile.

## LONDON.

*Bethlem Royal Hospital, Monks Orchard, Eden Park, Beckenham, Kent.* Phys. Supt., J. G. Porter Phillips, M.D., F.R.C.P. Eden Park, S.R., 12 min.

*See also Advt., p. 102*

*Brooke House, Clapton, E.5.* Res. Med. Supt., Dr. Ernest Rollins. Clapton, L. & N.E.R.

*See also Advt., p. 84*

*Camberwell House, 33, Peckham Road, S.E.5.* Senior Phys., H. J. Norman, M.B., Ch.B., D.P.H.

*See also Advt., p. 111*

*Chiswick House, Moss Lane, Pinner, Middlesex.* Douglas Macaulay, M.D. Pinner station,  $\frac{1}{2}$  mile.

*See also Advt., p. 103*

*Clarence Lodge, Clapham Park, S.W.4.* Res. Licensee, Miss L. Thwaites. Med. Off., Dr. Percy Smith. Clapham Road (Southern Ry.) and Clapham Common (South London Tube), 15 minutes. Tel.: 4913 Tulse Hill.

*See also Advt., p. 107*

*Fenstanton, Christchurch Road, Streatham Hill, S.W.* Res. Med. Supt., Madeline R. Lockwood, M.R.C.S., L.R.C.P., D.P.M. Tulse Hill, 5 minutes; Streatham Hill, 10 minutes. Tel.: Tulse Hill, 7181.

*See also Advt., p. 116*

*\*Flower House, Catford, S.E.6.* Med. Supt., Wm. F. Umney, M.D. Res. Lic., Mrs. Walter & Beckett. Beckenham Hill, S.R. 5 minutes.

*See also Advt., p. 114*

*Halliford House, Upper Halliford, Shepperton, S.W.* Res. Med. Supt., W. J. H. Haslett, M.R.C.S. Sunbury station,  $\frac{1}{2}$  miles.

*\*Hayes Park, Hayes, Middlesex.* Res. Med. Off., D. H. F. Stilwell. Hayes, 2 miles.

*\*Hendon Grove Private Mental Home, Hendon, N.W.4.* (ladies only). Res. Med. Off. and Licensee, Dr. H. R. S. Walford. Hendon Central (Hampstead Line),  $\frac{1}{2}$  mile.

**LONDON COUNTY COUNCIL Mental Hospitals** (under the direction of the Mental Hospitals Dept., Shell-Mex House, Strand, W.C.2.) :—

*Banstead, Sutton, Surrey.* Res. Med. Supt., A. A. W. Petrie, M.D., F.R.C.S., F.R.C.P., D.P.M. Belmont station, S.R.,  $\frac{1}{2}$  mile; Sutton, S.R.,  $\frac{1}{2}$  miles.

*Bexley, Kent.* Res. Med. Supt., G. Clarke, M.D. Bexley, S.R.,  $\frac{1}{2}$  miles.

*Cane Hill, Coulsdon, Surrey.* Res. Med. Supt., G. A. Lilly, M.C., M.A., M.D., B.Ch., D.P.M. Coulsdon South or Coulsdon North, S.R.,  $\frac{1}{2}$  miles.

*Claybury, Woodford Bridge, Essex.* Res. Med. Supt., G. F. Barham, M.A., M.D., B.Ch. Woodford, L. & N.E.R.,  $\frac{1}{2}$  miles.

*Colney Hatch, N.11.* Res. Med. Supt., J. Brander, M.D., F.R.C.P., D.P.M. New Southgate, L. & N.E.R. adjoining.

*Ewell, Epsom, Surrey.* Res. Med. Supt., L. H. Wootton, M.C., B.Sc., M.B., B.S., D.P.M. Epsom, S.R., 2 miles; Ewell, S.R., 1 mile.

*Hanwell, Southall, Middlesex.* Res. Med. Supt., A. W. Daniel, B.A., M.D., B.Ch. Hanwell, G.W.R., 1 mile.

*Horton, Epsom, Surrey.* Res. Med. Supt., W. D. Nicol, M.B., B.S., M.R.C.P., D.P.M. Epsom, S.R.,  $\frac{1}{2}$  miles.

*Long Grove, Epsom, Surrey.* Res. Med. Supt., F. G. L. Barnes, M.B., B.S., D.P.M. Epsom, S.R.,  $\frac{1}{2}$  miles.

*Maudsley Hospital, Denmark Hill, S.E.5.* For treatment of neurosis and curable mental disorder (voluntary patients only). Med. Supt., E. Mapother, M.D., F.R.C.S., F.R.C.P. Denmark Hill, S.R.,  $\frac{1}{2}$  mile.

*See also Advt., p. 59*

*Tooting Bec Hospital, Tooting Bec Road, S.W.17.* Res. Med. Supt., P. M. Turabull, M.C., M.B., Ch.B., D.P.M. Balham, S.R., 3 minutes.

*West Park, Epsom, Surrey.* Res. Med. Supt., N. Roberts, O.B.E., M.D., B.S., D.P.M. Epsom, S.R.,  $\frac{1}{2}$  miles.

*\*Moorcroft House, Hillingdon, Uxbridge, 2 miles.* Med. Licensees, Dr. R. J. Stilwell and Dr. G. W. B. James. West Drayton station, 2 miles.

*Newlands House, Tooting Bec Common, S.W.17.* Private Mental Hospital. Phys. Supt., Dr. Noel Sergeant. Balham station, 1 mile; Trinity Road Station (Underground),  $\frac{1}{2}$  mile. Motor bus Nos. 49, 49a, 49b, and 19a.

*See also Advt., p. 115*

*Northumberland House, Green Lanes, N.4.* Res. Med. Supt., Frederick Dillon, M.D. Manor House station, Piccadilly Underground, and Finsbury Park (G.N.) station.

*See also Advt., p. 105*

*Peckham House, 112, Peckham Road, S.E.15.* Props., A. H. & H. G. Stocker. Res. Med. Supt., Dr. F. R. King. Peckham Rye station, 10 minutes' walk.

*See also Advt., p. 111*

*\*Springfield Mental Hospital, Tooting, S.W.17.* Med. Supt., R. Worth, O.B.E., M.B., B.S. Wandsworth Common station, 1 mile.

*\*The Priory, Roehampton, S.W.15.* Res. Med. Supt., Dr. B. W. Brown. Barnes station, 10 minutes. Telephone 'Prospect' 1743.

*West Ham Mental Hospital, Goodmayes, Essex.* Res. Med. Supt., Dr. James Harvey Cuthbert. Goodmayes, L. & N.E.R., 1 mile.

*\*Wood End House, Hayes (ladies).* Med. Lic., Dr. R. J. Stilwell and Dr. G. W. B. James. Hayes, 1 mile; Uxbridge, 3 miles.

*Wyke House, Isleworth, Middlesex.* Res. Phys., G. W. Smith, O.B.E., M.B., Ch.B. Edin. Syon Lane, S.R., Osterley, District and Piccadilly.

*See also Advt., p. 111*

## NORFOLK.

*Bethel Hospital for Mental and Nervous Disorders, Norwich.* Res. Med. Supt., S. J. Fielding, M.B. Cona. Phys., Saml. J. Barton, M.D. Norwich (Thorpe) station, 1 mile. See also *Advt.*, p. 106

*City of Norwich Mental Hospital, Hellesdon, near Norwich.* Res. Phys. and Supt., Dr. Charlton Robert Frederick Hall. Hellesdon, 1 mile.

*Heigham Hall Private Mental Hospital, Norwich.* Res. Med. Supt., Dr. J. A. Small. Norwich station, 1½ miles.

See also *Advt.*, p. 105

*Norfolk County Mental Hospital, Thorpe, Norwich.* Res. Med. Supt., O. G. Connell, M.C., L.R.C.P. & S. Whitlingham, 1 mile; Norwich, 2½ miles.

*The Grove, Catton Grove Road, Norwich, (for ladies).* Vis. Phys., S. Barton, M.D. Apply to Miss McLintock. Nearest station, Norwich Melton.

## NORTHAMPTONSHIRE.

*Berrywood Mental Hospital, Northampton.* Res. Med. Supt., Dr. E. D. T. Hayes. L.M. & S.R. (L. & N.W.) station, 2½ miles; L.M. & S.R. (Mid.), 3 miles.

*St. Andrew's Hospital, Northampton.* Med. Supt., D. F. Rambaut, M.A., M.D. Station, 1 mile. See also *Advt.*, p. 104

## NORTHUMBERLAND.

*City Mental Hospital, Gosforth, Newcastle-on-Tyne.* Res. Med. Supt., H. D. MacPhail, M.D. Newcastle Central, L. & N.E.R., 3 miles.

*Gateshead Mental Hospital, Stannington.* Res. Med. Supt., Dr. C. B. Bamford. Stannington, L. & N.E.R., 2½ miles.

*Northumberland Mental Hospital, Morpeth.* Res. Med. Supt., Guy R. East, M.D., D.P.H. Morpeth station, 1 mile.

## NOTTINGHAMSHIRE.

*City Mental Hospital, Mapperley Hill, Nottingham.* Res. Med. Supt., G. L. Brunton, M.D. Nottingham, 2 miles.

*Notts County Mental Hospital, Radcliffe-on-Trent, near Nottingham.* Res. Med. Supt., H. C. Waldo, M.R.C.S., L.R.C.P. Radcliffe-on-Trent, 2 miles.

*The Coppice, Nottingham.* Res. Med. Supt., David Hunter, M.B. (Camb.). L.M. & S.R. station, 2½ miles; L. & N.E.R. station, 1½ miles. See also *Advt.*, p. 106

## OXFORDSHIRE.

*Oxford County and City Mental Hospital, Littlemore, Oxford.* Res. Med. Supt., Thomas Saxty Good, O.B.E., M.A. (Oxon.), M.R.C.S., L.R.C.P. Littlemore station adjoining.

*The Warneford, Oxford, 1½ miles.* Res. Med. Supt., Alex. W. Neill, M.D. Oxford station, 2½ miles. See also *Advt.*, p. 109

## SHROPSHIRE.

*Salop Mental Hospital, Bicton Heath, Shrewsbury.* Res. Med. Supt., W. S. Hughes, M.B., B.S. Shrewsbury, 2½ miles.

*Stretton House, Church Stretton (for gentlemen).* Res. Med. Supt., Dr. C. A. Stone. Church Stretton, G.W.R. and L.M. & S.R., ½ mile. See also *Advt.*, p. 113

*The Grove House, Church Stretton (for ladies).* Res. Med. Supt., Dr. J. McClintock. Church Stretton station, 1 mile. See also *Advt.*, p. 113

## SOMERSETSHIRE.

*Bailbrook House, Bathaston, Bath.* Res. Phys., Arthur Guirddham, M.A., D.M. (Oxon.), D.P.M. (Lond.). Bath, G.W.R., or L.M. & S.R., 10 minutes' drive.

See also *Advt.*, p. 115

*\*Brislington House, near Bristol.* Res. Physician, Dr. F. E. Fox. Bristol, 3 miles.

*Somerset & Bath Mental Hospital, Gifford, near Taunton.* Res. Med. Supt., Dr. W. S. Graham. Norton Fitzwarren station, 2 miles.

*The Mental Hospital, Wells, Som.* Res. Med. Supt., Dr. J. McGarvey. Wells station, S. & D.J.R., and G.W.R., 1½ miles.

## STAFFORDSHIRE.

*Ashwood House, Kingswinford, Dudley.* Prop. and Res. Med. Supt., Dr. J. F. G. Pietersen. Stourbridge Junc., 3½ miles; Dudley station, 4 miles; Wolverhampton, 7 miles. Tel.: 19 Kingswinford.

See also *Advt.*, p. 112

*Coton Hill Mental Hospital, Stafford.* Res. Med. Supt., R. MacDonald, M.D., D.P.M. Stafford, 1 mile.

See also *Advt.*, p. 112

*County Mental Hospital, Burntwood, near Lichfield.* Res. Med. Supt., W. Reid, M.A., M.B. Lichfield City, 3½ miles; Hammerwich, 1½ miles.

*\*County Mental Hospital, Cheddleton, Leek.* Med. Supt., W. F. Menzies, M.D. Wall Grange station, 1 mile.

*County Mental Hospital, Stafford.* Res. Med. Supt., B. H. Shaw, M.D. Stafford, 1 mile.

*\*The Moat House, Tamworth (for ladies).* Res. Medical Attendant, Dr. W. Lowson. Tamworth station, ½ mile.

## SUFFOLK.

*St. Audry's Hospital for Mental Diseases, Melton.* Res. Med. Supt., W. Brooks Keith, M.C., M.D. Melton station, 1½ miles; Woodbridge station, 2½ miles.

*\*The Mental Hospital, Ipswich.* Res. Med. Supt., P. Banbury, D.P.M. Ipswich, 2 miles.

## SURREY.

*County Mental Hospital, Brookwood, Woking.* Res. Med. Supt., J. A. Lowry, M.D. Brookwood station, 1½ miles.

*Netherne Hospital, Coulsdon.* Res. Med. Supt., Dr. L. M. Webber. Coulsdon station, 2 miles.

*\*Croydon Mental Hospital, Warlingham.* Res. Med. Supt., H. M. Berncastle, M.R.C.S., L.R.C.P. Upper Warlingham, 3½ miles.

*Holloway Sanatorium, Registered Mental Hospital, St. Ann's Heath, Virginia Water.* Res. Med. Supt., Henry Devine, O.B.E., M.D., B.S., F.R.C.P. Asst. Med. Offs., Thomas E. Harper, M.R.C.S. (Eng.), L.R.C.P. (Lond.), Cecil Rutherford, B.A., M.B., B.Ch., B.A.O., Cyril R. Harris, M.B., B.Ch., B.A.O., B.A., Harriette Grenelle Bogle, M.B., B.Ch., M.D. (Edin.). Virginia Water station, 5 minutes. Seaside Branch, *St. Ann's, Canford Cliffs, Bournemouth.* Med. Off., Vincent P. Norman, M.D., F.R.C.S., D.P.H. See also Advt., p. 108

## SUSSEX.

*\*Ashbrook Hall, Hollington, St. Leonards-on-Sea* (for ladies). Res. Lic., Charles E. H. Somerset. Warrior Square station, 2 miles.

*\*Beechmont, Lewes Road, Haywards Heath.* For female private patients. Apply Med. Supt.

*Brighton County Borough Mental Hospital, Haywards Heath.* Res. Med. Supt., G. H. Harper-Smith, M.A., M.D. Haywards Heath station, 1½ miles.

*East Sussex County Mental Hospital, Hellingly, near Eastbourne.* Res. Med. Supt., Benjamin Reid, M.D., M.R.C.P., D.P.M. Hellingly station, 1 mile.

*\*Peritau House, Winchelsea, near Hastings* (for ladies). Physician, Harvey Baird, M.D. Winchelsea station, 1 mile.

*\*St. George's Retreat, Burgess Hill.* Licensee, Miss Mary Doran. Med. Supt., Dr. R. D. Pennefather. Burgess Hill station, 2 miles.

*\*Ticehurst House, Ticehurst.* Res. Med. Supt., C. F. F. McDowall, M.D. Wadhurst, 4 miles, or Ticehurst Rd., 3 miles.

*West Sussex Mental Hospital, Greylingwell, Chichester.* Res. Med. Supt., C. G. Ainsworth, M.A., LL.B., M.B., B.Ch. Chichester station, 1½ miles.

## WARWICKSHIRE.

*Birmingham City Mental Hospital, Winsor Green.* Res. Med. Supt., Dr. C. W. Forsyth. Birmingham, 1½ miles; Soho, ½ mile.

*County Mental Hospital, Hatton, near Warwick.* Res. Med. Supt., H. B. Leech, B.A., B.Ch., B.A.O., M.D. (Dub.). Also *Leigh House*, for lady private patients. Warwick, G.W.R. station, 3 miles.

See also Advt. p. 116

*Glendossill, Henley-in-Arden, Warwickshire.* Res. Med. Supt., Dr. W. Agar. Henley-in-Arden, G.W.R., ¾ mile.

*Rubery Hill and Hollymoor Mental Hospital, Birmingham.* Res. Med. Supt., T. C. Graves, M.D., F.R.C.S. Rubery station, ½ mile; Northfield, L.M. & S.R., 1 mile.

## WILTS.

*Fiddington House, Market Lavington.* Med. Supt., J. R. Benson, F.R.C.S. Res. Licensee, Dr. Gerald Benson. Lavington G.W.R., 1 mile; Devizes, 6 miles.

See also Advt. p. 1

*\*Kingsdown House, Box.* 5 miles from Bath. Res. Med. Supt., Dr. H. C. MacBryan.

*\*Laverstock House, Salisbury.* Med. Supt., J. R. Benson, F.R.C.S., L.R.C.P. Salisbury, 1½ miles. See also Advt., p. 103

*Old Manor Mental Hospital, Salisbury.* Med. Supt., Dr. S. E. Martin. Salisbury station, S.R., 5 minutes.

See also Advt., p. 107

*Wilts County Mental Hospital, Devizes.* Res. Med. Supt., J. W. Leech, M.D. Devizes station, 1½ miles.

## WORCESTERSHIRE.

*County & City Mental Hospital, Powick, Worcester.* Res. Med. Supt., Dr. H. F. Fenton. Worcester station, 4 miles.

*Worcestershire Mental Hospital, "Barnsley Hall," Bromsgrove.* Res. Med. Supt., Dr. A. H. Firth. Bromsgrove, L.M. & S.R., 2½ miles.

## YORKSHIRE.

*Bootham Park Registered Hospital, York.* Res. Med. Supt., G. R. Jeffrey, M.D. York station, 1 mile. See also Advt., p. 115

*City Mental Hospital, Hull.* Res. Med. Supt., Dr. J. S. Anderson. Willerby station, 1 mile; Hull, 6 miles.

*East Riding of Yorkshire County Mental Hospital, Beverley.* Res. Med. Supt., T. M. Davie, M.C., M.D. Beverley station, 2 miles.

*Moorlyn, Mount Villas, York.* Res. Phys. Supt., Dr. Janie S. Baugh. Telephone 6117. York station, 1 mile.

*North Riding of Yorkshire Mental Hospital, Clifton, York.* Res. Med. Supt., Dr. J. I. Russell. York, 2 miles.

*\*St. Luke's Hospital, Middlesbrough.* Res. Med. Supt., Dr. H. G. Drake-Brockman. Middlesbrough, 2 miles.

*South Yorkshire Mental Hospital, Wadsley, near Sheffield.* Res. Med. Supt., Arthur Pool, M.R.C.P. Wadsley Bridge, 1 mile (goods); Sheffield, 4 miles (passengers).

*The Friends' Retreat, York.* Res. Med. Supt., Dr. Neil Macleod. York station, 1½ miles. See also Advt., p. 79

*The Grange, Rotherham.* 5 miles from Sheffield (for Ladies). Res. Phys., G. E. Mould, M.R.C.S., L.R.C.P. Grange Lane station, L. & N.E.R., ½ mile.

See also Advt., p. 110

*West Riding Mental Hospital, Menston, near Leeds.* Res. Med. Supt., R. Clive Walker, M.D. Guiseley, L.M. & S.R., 1 mile.

*Wm. Nisbet Mental Hospital, Burley-in-Wharfedale, Spalden Park.* Res. Med. Supt., Dr. J. R. Gilmanour. Burley-in-Wharfedale station, L.B.L. & S.R.,  $\frac{1}{2}$  mile.

*West Riding Mental Hospital, Northes Hall, Kirkburton, near Huddersfield.* Res. Med. Supt., C. W. Irvine. L.R.C.P. and S.L., D.P.M. Huddersfield, 5 miles. Kirkburton (Goods only),  $\frac{1}{2}$  miles.

*West Riding Mental Hospital, Wakefield.* Med. Supt., C. J. Thomas. M.R.C.S., L.R.C.P., D.P.M., D.P.H. Kirkgate and Westgate stations, 1 mile.

*York City Mental Hospital, Fulford, York.* Res. Med. Supt., Dr. R. A. Hooper. Naburn, L. & N.E.R., 1 mile.

#### CHANNEL ISLANDS.

*St. Peter Port Asylum, Guernsey. Country Asylum, Castel, Guernsey.* Med. Off., W. R. McGlashan, M.A., M.B., Ch.B., D.P.M. Phys. Supt., Mental Health Services, Guernsey, G.I.

*Jersey Mental Hospital, Jersey.* Res. Med. Supt., C. Noble le Brocq, M.D. St. Helier, 3 miles.

#### ISLE OF MAN.

*Mental Hospital, Union Mills, Douglas.* Res. Med. Supt., Leslie H. Skene, M.C., M.B., Ch.B., Dipl. Psych. (Ed.) Union Mills,  $\frac{1}{2}$  mile.

#### BRECKNOCKSHIRE.

*\*Mid-Wales Counties Mental Hospital, Talgarth.* Res. Med. Supt., Dr. P. Drummond. Talgarth, 1 mile.

#### CARMARTHENSHIRE.

*\*Joint Counties Mental Hospital, Carmarthen.* Res. Med. Supt., Sidney Davies, M.B., B.S., D.P.M. Carmarthen, G.W.R. station,  $1\frac{1}{2}$  miles.

#### DENBIGHSHIRE.

*\*North Wales Counties Mental Hospital, Denbigh.* Res. Med. Supt., Frank G. Jones, M.B. Denbigh, 1 mile.

#### GLAMORGANSHIRE.

*Cardiff City Mental Hospital, Whitchurch, Cardiff.* Res. Med. Supt., P. K. McCowan, M.D., F.R.C.P., D.P.M., Barrister-at-Law. Llandaff, G.W.R. station, 1 mile.

*Glamorgan County Mental Hospital, Bridgend.* Res. Med. Supt., D. Rhyd Owen, M.B. Bridgend,  $1\frac{1}{2}$  miles.

*Swansea Mental Hospital, Cefn Coed, Swansea.* Med. Supt., N. Moulson, M.D., D.P.M. Cockett, G.W.R., 1 mile.

#### MONMOUTHSHIRE.

*Monmouthshire Mental Hospital, Aberavenny.* Res. Med. Supt., N. R. Phillips, M.D. G.W.R. station,  $\frac{1}{2}$  mile, L.M. & S.R.,  $\frac{1}{2}$  mile.

*\*Newport Mental Hospital, Caerleon.* Res. Med. Supt., Dr. M. R. Mackay, M.C. Caerleon,  $\frac{1}{2}$  mile.

#### ABERDEENSHIRE.

*\*Aberdeen City Mental Hospital.* Res. Med. Supt., Dr. J. S. Annandale. Newmachar station,  $1\frac{1}{2}$  miles.

*Aberdeen Royal Mental Hospital.* Res. Med. Supt., R. Dods Brown, M.D.; Sec., John A. McConachie, 230, Union Street. Aberdeen station, 1 mile.

#### ANGUS.

*Baldovan Institution, Dundee* (for the treatment and education of mental defectives). Res. Med. Supt., D. J. Forbes, M.B., Ch.B. Downfield, 1 mile; Dundee,  $4\frac{1}{2}$  miles.

*Dundee Mental Hospital, Westgreen, Dundee.* Res. Med. Supt., W. Tuach-Mackenzie, M.D. Dundee, 3 miles; Lift,  $1\frac{1}{2}$  miles.

*Dundee Royal Asylum, Gowrie House, Dundee.* Med. Off., A. B. Dalgetty, M.D. Sec., J. Murray Wilkie, 27, Bank Street, Dundee. Miss M. E. Whyte, Supt.

*The Royal Asylum, Montrose.* Res. Med. Supt., C. J. Shaw, M.D. Dubton, 1 mile; Montrose, 3 miles.

#### ARGYLLSHIRE.

*Argyll and Bute District Mental Hospital, Lochgilphead.* Res. Med. Supt., D. Ross, M.B., Ch.B., M.R.C.P.E. By rail to Gourock, thence by steamer to Ardrishaig,  $2\frac{1}{2}$  miles, also motor bus service direct from Glasgow (85 miles), twice daily.

#### AYRSHIRE.

*Glengall Hospital, Ayr.* Med. Supt., Douglas McRae, M.D., F.R.C.P. Ayr station, 2 miles.

#### BANFFSHIRE.

*Ladysbridge Mental Hospital, Ladysbridge.* Res. Med. Supt., Dr. George M. Bell. Ladysbridge station, 300 yards.

#### DUMFRIESSHIRE.

*Crichton Royal, Dumfries.* Res. Med. Supt., Dr. C. C. Easterbrook. Dumfries, 1 mile.

#### EAST LOTHIAN.

*East Lothian District Asylum, Haddington.* Supt., Miss Jean M. Stevenson. Med. Off., H. H. Roberts, M.D. Haddington station, 10 minutes.

#### FIFESHIRE.

*Fife District Asylum, Cupar.* Res. Med. Supt., William Boyd, M.B., Ch.B. Springfield station, N.B.R.,  $\frac{1}{2}$  mile.

## INVERNESS-SHIRE.

*District Asylum, Inverness.* Res. Med. Supt., William McWilliam, M.D., D.P.M. Inverness, 2½ miles.

## LANARKSHIRE.

*District Mental Hospital, Woodilee, Glasgow.* Res. Med. Supt., H. Carre, L.R.C.P. & S. Lenzie station, 1 mile; Glasgow, 8 miles.

*Glasgow District Mental Hospital, Gartloch, Gartcosh.* Res. Med. Supt., Dr. A. M. Dryden. Garnkirk station, 1 mile.

*Glasgow Royal Mental Hospital, Gartnavel.* Res. Med. Supt., Dr. Angus MacNiven.

*Hawkhead Mental Hospital, Glasgow, S.W.2.* Res. Med. Supt., Dr. J. H. MacDonald. Crookston station.

*\*Kirklands Mental Hospital, Bothwell, Glasgow.* Res. Med. Supt., Wm. M. Buchanan, M.B. Bothwell and Fallside stations, ½ mile; Glasgow, 9 miles.

*Linark District Asylum, Hartwood, Lanarkshire.* Res. Med. Supt., Dr. N. T. Kerr. Hartwood, L.M.S. station, ½ mile.

## MIDLOTHIAN.

*Edinburgh District Mental Hospital, Bangour Village, West Lothian.* Res. Med. Supt., W. M. McAlister, F.R.C.P.E. Uphall, L. & N.E.R., 2 miles.

*New Saughton Hall, Hospital, Polton, Midlothian.* Director, W. M. C. Harrowes, M.D., D.P.M. (Lond.). Resident Medical Staff. Polton, 5 minutes; Loanhead, 10 minutes' walk. Bus from Edinburgh, 20 minutes.

*\*Midlothian and Peebles District Asylum.* Res. Med. Supt., James H. C. Orr, M.D. Rosslynlee, 1 mile; Edinburgh, 12 miles.

*Royal Edinburgh Hospital for Mental and Nervous Disorders, Morningside.* Res. Phys. Supt., Professor D. K. Henderson, M.D., F.R.C.P. Caledonian station, L.M.S., 1½ miles.

## MORAYSHIRE.

*Morayshire Mental Hospital, Elgin.* Res. Supt., Miss Annie A. Kinloch. Vis. Med. Off., Dr. A. C. Macdonald. Elgin, 1½ miles.

## PERTSHIRE.

*District Asylum, Murthly, Perth.* Res. Med. Supt., Lewis C. Bruce, M.C., M.D. Murthly station adjoins the Asylum.

*James Murray's Royal Mental Hospital, Perth* (for patients of the middle and upper classes). Phys. Supt., W. D. Chambers, M.A., M.D., F.R.C.P.E. Perth station, under 2 miles.

## RENFREWSHIRE.

*\*Craw Road Asylum, Paisley.* Res. Med. Off., Miss Enid Dixon, M.B., Ch.B. Paisley, 1 mile.

*Dykebar Mental Hospital, Paisley.* Res. Med. Supt., R. D. Hotchkiss, M.D. Paisley, 2½ miles.

*Smithston Asylum, Greenock.* Res. Med. Supt., Wm. Leggett, M.D. Greenock West, 1½ miles; Ravenscraig, ½ mile.

*\*The Mental Hospital, Riccarton, Paisley.* Med. Supt., Mary R. Knight, M.A., M.B., Ch.B. Paisley West, ½ mile.

## ROXBURGHSHIRE.

*Roxburgh, Berwick, and Selkirk District Asylum, Melrose.* Res. Med. Supt., Patrick Steele, M.D. Melrose, ½ mile.

*\*St. Andrews, Stirches, Hawick.* Vis. Phys., A. N. Bruce, M.D. Licensee, Sister Mary Agnes. Hawick station, 1 mile.

## STIRLINGSHIRE.

*District Mental Hospital, Larbert, Stirling.* Res. Med. Supt., J. A. Jenkins, M.B., Ch.B. Larbert, L.M. & S.R., 1½ miles.

## ANTRIM.

*Antrim County Mental Hospital, Antrim.* Res. Med. Supt., Dr. Arthur R. Boyd. Antrim station, 1½ miles.

*Belfast Mental Hospital, Purdysburn, near Belfast.* Res. Med. Supt., Dr. S. J. Graham. Belfast, G.N.R. station, 3 miles.

## ARMAGH.

*\*County Mental Hospital, Armagh.* Res. Med. Supt., Dr. Dora E. Allman. Armagh station, ½ mile.

*The Retreat, Armagh.* Apply. Res. Med. Supt., or Capt. A. D. Allen. Richhill station, 1½ miles, or Armagh station, 3 miles.

## CARLOW.

*\*District Mental Hospital, Carlow.* Res. Med. Supt., Dr. T. A. Greens. Carlow, ½ mile.

## CLARE.

*Clare Mental Hospital, Ennis.* Res. Med. Supt., Dr. F. O'Mara. Ennis, 2 miles.

## CORK.

*\*Cork District Mental Hospital, Cork.* Res. Med. Supt., Dr. B. F. Honan. Cork station, 1½ miles.

*\*Lindville Private Mental Hospital, Cork.* Proprietress, Mrs. E. Osburne. Res. Med. Off., Dr. J. C. Osburne. Cork station, 2 miles by tram.

## DONEGAL.

*Donegal District Mental Hospital, Letterkenny.* Res. Med. Supt., Joseph Kearney, M.B., D.P.H., D.P.M., Letterkenny and Lough Swilly Rly., or Strabane & Letterkenny Rly., 1 mile.

## DOWN.

*Down Mental Hospital* (400 beds).  
Downpatrick. Res. Med. Supt., Douglas  
B. M. Loshian, M.B., Ch.B. (Edin.), D.P.M.  
(Lond.), M.R.C.P. and F.R.C.P. (Edin.).  
Downpatrick, 1 mile.

## DUBLIN.

*Bloomfield, Morchamilton Rd., Dublin.*  
Med. Off., H. T. Bowley, M.D.

*Farnham House and Marysville, Finglas,  
Co. Dublin.* Res. Med. Supt., H. R. C.  
Rutherford, F.R.C.S.I., D.P.H. Motor  
bus from Dublin, 2 miles.

See also Advt., p. 112

*Grangegorman Mental Hospital, Dublin.*  
Res. Med. Supt., Dr. J. O'Connor Donelan.  
Also Portrane Branch, Donabate, Co.  
Dublin. Dep. Res. Med. Supt., Dr.  
Stanley Blake. Donabate station, 1½  
miles.

*Highfield, Drumcondra (for ladies);  
Hampstead, Glasnevin (for gentlemen).*  
Res. Med. Supt., Wm. N. Eustace,  
L.R.C.P.I. and S.I. By rail, Dublin.

See also Advt., p. 82

*House of St. John of God, Stillorgan,  
Dublin.* Res. Phys., Dr. J. J. Boland  
and Dr. F. Whitaker. Stillorgan station,  
½ mile.

*\*St. Patrick's Hospital, James's Street,  
Dublin.* Res. Med. Supt., Dr. R. R.  
Leeper. Branch Asylums at St. Edmonds-  
bury, Lucan. See also Advt., p. 105

*St. Vincent's Mental Hospital, Fairview,  
Dublin.* Vis. Physicians, John Murphy,  
F.R.C.P.I., and F.X. Callaghan, F.R.C.P.I.  
Apply to the Superioress.

*\*Stewart Institution and Hospital for  
Mental Diseases, Palmerstown, Co. Dublin.*  
Res. Med. Supt., G. H. Keene, M.D.  
Kingsbridge, Dublin, 3 miles.

*Verville Clontarf, Dublin.* Med. Sup.,  
P. D. Sullivan, F.R.C.S.I. Clontarf, 1  
mile.

## GALWAY.

*\*Ballinasloe Mental Hospital, Ballinasloe.*  
Res. Med. Supt., John Mills, M.B.  
Ballinasloe station, 2 miles.

## KERRY.

*District Mental Hospital, Killarney.*  
Res. Med. Supt., E. N. M. O'Sullivan, B.A.,  
M.B., B.Ch., D.P.M. Killarney, ½ mile.

## KILKENNY.

*\*District Mental Hospital, Kilkenny.*  
Res. Med. Supt., Dr. P. J. Cassin. Kil-  
kenny station, ½ mile.

## LIMERICK.

*District Mental Hospital, Limerick.*  
Res. Med. Supt., Dr. P. J. Irwin. Limer-  
ick ½ mile.

## LONDONDERRY.

*\*District Asylum, Londonderry.* Res.  
Med. Supt., John Watson, M.C., M.B.,  
B.Ch. Londonderry, 1 mile.

## MAYO.

*Co. Mayo Mental Hospital, Castlebar.*  
Res. Med. Supt., Alfred Sheridan, L.R.C.P.  
and S.I. Castlebar, 1 mile.

## MONAGHAN.

*Monaghan Mental Hospital, Monaghan.*  
Res. Med. Supt., Dr. T. P. Conlon.  
Monaghan, ½ mile.

## QUEENS' COUNTY.

*\*District Mental Hospital, Portlaoighise.*  
Res. Med. Supt., Dr. Pierce Grace.  
Portlaoighise, ½ mile.

## SLIGO.

*\*District Mental Hospital, Sligo.* Res.  
Med. Supt., Dr. John Dunne. Sligo, 1½  
miles.

## TIPPERARY.

*\*District Mental Hospital, Clonmel.* Res.  
Med. Supt., Dr. J. F. Fitzgerald. Clonmel,  
1 mile.

## TYRONE.

*The Mental Hospital, Omagh, Co. Tyrone.*  
Res. Med. Supt., Dr. J. Moore Johnston.  
Omagh, 2 miles.

## WATERFORD.

*Bon Sauveur Mental Home, Carriglea,  
Dungarvan, Waterford (for ladies).* Con-  
ducted by the Order of Bon Sauveur.  
Vis. Phys., Dr. D. T. McCarthy. Dun-  
garvan station, 3½ miles.

*District Mental Hospital, Waterford.*  
Res. Med. Supt., Dr. Alexis FitzGerald.  
G.S. & W.R., North station, 2 miles.

*\*St. Patrick's Private Mental Hospital,  
Belmont Park, Waterford (for gentle-  
men).* Conducted by the Brothers of  
Charity. Vis. Phys., Dr. M. Coghlan.  
Waterford station, 1 mile.

## WESTMEATH.

*District Mental Hospital, Mullingar.*  
Mullingar station, 1 mile.

## WEXFORD.

*District Mental Hospital, Enniscorthy.*  
Res. Med. Supt., Dr. Bernard Lyons.  
Enniscorthy, 1 mile.



## MENTAL DEFICIENCY ACT, 1913 : CERTIFIED INSTITUTIONS AND HOUSES.

Those marked with an asterisk (\*) have not returned our form sent for correction.

*Class A.*—Certified Institutions.    *Class B.*—Institutions approved under Section 37.  
*Class C.*—Certified Houses.        *Class D.*—Approved Homes.

### BEDFORDSHIRE.

*\*Bronham House, Bronham, near Bedford.*  
For 24 males. Non-Res. Med. Supt., Dr. C. G. Welch. Lay Supt., M. Wallenger. Oakley, 2 miles. (*Class A.*)

### BERKSHIRE.

*Cumnor Rise, Oxford.*—34 females. High-grade feeble-minded. Supt., Miss Evans. (*Class A.*)

### BUCKINGHAMSHIRE.

*\*The Manor House Institution, Aylesbury.*  
For 56 males and 43 females. Supt., Miss E. Boughton. Managers, Bucks Mental Deficiency Committee. (*Class A.*) Aylesbury,  $\frac{1}{2}$  mile.

*Winslow Institution, Winslow.*—(For Bucks County cases only.) 8 male, 38 female, adults. Feeble-minded and imbecile. Supt., J. Burden. I. Burden, Matron, S.R.N., C.M.B. (*Class B.*)

### CHESHIRE.

*Ashton House, 26, Village Road, Oxton, Birkenhead.* For 64 high-grade patients over 14 years old (female). Lady Supt., Miss O. M. Wilkinson. (*Class A.*) Woodside, about 20 minutes by tram; also underground from Liverpool.

*\*The Mary Dendy Home, Sandbridge, near Alderley Edge.* 425 males and females. Educable mentally defective children under 13 years of age. President, Carey M. Bowden, Esq., J.P. Sec., E. M. Richards, 72, Bridge Street, Manchester. (*Class A.*)

### CUMBERLAND.

*Dovenby Hall Colony, Cockermouth.* For 185, both sexes. Supt., Miss S. J. Bevan. (*Class A.*) Cockermouth,  $2\frac{1}{2}$  miles.

*Durran Hill House, Carlisle.* 65 females. Feeble-minded. Higher grade. Supt., Sr. B. Purcell. (*Class A.*) Carlisle station, 2 miles.

### DERBYSHIRE.

*\*Thornhill, Trowels Lane, Derby.* For females. Supt., Miss S. McGarvie. (*Class A.*)

*Whittington Hall, Whittington, near Chesterfield.* 400 females. Managers, The Incorporation of National Institutions for Patients requiring Care and Control, 14, Howick Place, Victoria Street, S.W.1. (*Class A.*)

### DEVON.

*Royal Western Counties Institution, Starcross.* 750 males and females (trainable children and adults). Sec., L. W. Hedger. Supt., C. W. Mayer. (*Class A.*)  
*Stoke Lyne, Withycombe, Exmouth.* 50 males. Managers, Devon County Council. Supt., Miss H. E. Darlington. (*Class A.*)

### DURHAM.

*\*Monckton Hall Home for Lads, Jarrow-on-Tyne.* 79 males. Supt., Mrs. A. H. Piggott. (*Class A.*)

*\*Shotley Bridge Colony, Shotley Bridge, Durham.* 279 males, 194 females. Matron Supt., Miss H. L. C. Yates. (*Class A.*) Shotley Bridge, L. & N.E.R.,  $\frac{1}{4}$  mile.

### ESSEX.

*\*Bigods Hall, R. C. Special School, near Dunmow.* 61 high-grade boys. Corresponding Manager, Rev. Sr. Rosalie Dunne, Chigwell Convent, Woodford Bridge, Essex. Supt., Sr. J. Scully. (*Class A.*)

*Brunswick House, Mistley, Essex.* 75 males (London cases only). Managers, L.C.C. Mental Hospitals Committee. Res. Supt., S. E. Dudley. (*Class A.*) Wistley, L.N.E.R.,  $\frac{1}{2}$  mile.

*\*Etloe House, Church Road, Leyton.* 120 high-grade feeble-minded females over 16. Supt., Sr. C. Keogh. (*Class A.*) Leyton, L. & N.E.R.,  $\frac{1}{4}$  mile.

*Royal Eastern Counties Institution Ltd., Colchester.* 1900 males and females, all grades. Med. Supt., Dr. F. D. Turner. (*Class A.*)

*South Ockenden Colony, South Ockenden, Essex.* 84 males, 52 females. Supt., Miss W. S. Butler. (*Class A.*) Ockenden,  $\frac{1}{4}$  mile.

*The Mutual Sanatorium, Billericay, Essex.* 54 males of the middle class. Non-Res. Med. Supt., W. Shackleton, M.D. Res. Lay Supt., A. J. Read. (*Class A.*) Billericay, L. & N.E.R., 1 mile.

### GLOUCESTERSHIRE.

*Brentry Colony, Westbury-on-Trym, Bristol.* 381 males over 18 years of age. Res. Med. Supt., G. de M. Rudolf. Henbury station,  $1\frac{1}{2}$  miles. (*Class A.*)

*Hortham Colony (City and County of Bristol), Almondsbury, near Bristol.* 304 males, 304 females. Res. Med. Supt., Walter Wyatt, M.B., B.Ch. (Edin.) D.P.M. (*Class A.*) Patchway, G.W.R.,  $2\frac{1}{4}$  miles.

\**Royal Fort Home, St. Michael's Hill, Bristol.* 30 females, high-grade mentally deficient. Hon. Sec., Mrs. Murray, 77, Staplepool Rd., Westminster, Bristol. Lay Supt., Miss Coles. (Class A.) Bristol, 1 mile.

*St. Mary's Home, Painswick, Stroud, Glos.* 29 females. High-grade feeble-minded. Apply, Lady Supt. (Class A.) Stroud, 3 miles.

*Stoke Park Colony, Hanham Hall, Hanham, near Bristol.* 249 females. Managers. The Incorporation of National Institutions for Persons requiring Care and Control. (Class A.)

*Stoke Park Colony, Stapleton, Bristol.* 790 patients of both sexes. Managers. The Incorporation of National Institutions for Persons requiring Care and Control. (Class A.) See also *Advt.*, p. 53

*Stoke Park Colony, West Side, Stapleton.* 528 males. Managers. The Incorporation of National Institutions for Persons requiring Care and Control. (Class A.)

*Stapleton Institution, Bristol.* 100 adult males, 100 females. Superintendent, A. F. Waters. (Class B.)

#### HAMPSHIRE.

*Coldestate Colony, Salisbury, near Southampton.* 500 both sexes. Res. Med. Supt., Alban Wilson. Asst. Med. Off., K. W. Mackie. (Class A.) Swanwick station, S.R., 1 mile.

*Mount Tabor, Basingstoke, Hants.* Church of England institution for 50 high-grade females over 16 years of age, with annexe for 20 low-grade girls under 16 years of age. Vis. Med. Off., Dr. Kelly. Supt., The Rev. Mother Superior, Sisters of the Transfiguration. (Class A.) Basingstoke, S.R.,  $\frac{1}{2}$  mile.

*St. Mary's Home, Alton.* 45 mentally and morally deficient females. Managers, The Wantage Community of Sisters. Non-Res. Med. Supt., Dr. O. V. Payne, Lansdown House, Alton. Supt., The Sister Superior. (Class A.) Alton, 15 minutes, about  $\frac{1}{2}$  mile.

*Titchbury Mount Colony, West Totton, Southampton.* 150 males. Supt., W. M. Worlock. (Class A.) Totton 2 $\frac{1}{2}$  miles.

#### HERTS.

*Arniston School, Boxmoor House, Hemel Hempstead, Herts.* 22 patients of either sex. (Class D.) Boxmoor, 10 minutes.

*Cell Barnes Colony, St. Albans, Herts.* Both sexes. Res. Med. Supt., Dr. N. H. M. Burke. (Class A.) St. Albans (City), 1 mile.

*Hillside Special School for Mentally Defective Boys, Buntingford.* 48 males under 16. Secretary, Westminster Diocesan Education Fund, Archbishop's House, Westminster, S.W.1. (Class A.)

*St. Elizabeth's Home for Epileptics, Much Hadham.* 56 children; 104 female adults. Apply to Secretary, Westminster Diocesan Education Fund, Archbishop's House, Westminster, S.W.1. (Class A.)

*St. Raphael's Colony, Barvin Park, near Potter's Bar, Herts.* 93 epileptic and mental defective males over 16. Secretary, Westminster Diocesan Education Fund, Archbishop's House, Westminster, S.W.1. (Class A.)

*Rowley Lodge, Rowley Green, Barnet.* Educational home for 15 very backward boys and girls. Principal, Miss Wall. (Class D.)

*The Middlesex Colony for Mental Defectives, Harper Lane, Shenley, near St. Albans.* 854 both sexes. Managers, Middlesex County Council. Res. Med. Supt., Dr. H. E. Beasley. (Class A.) Radlett, L.M. & S.R., 2 miles.

*Leaesden Mental Hospital, Abbot's Langley, Watford, Herts.* 2540 London cases only (both sexes). Managers, L.C.C. Mental Hospitals Committee. Res. Med. Supt., R. M. Stewart, M.D., F.R.C.P., D.P.M. (Class B.) Watford Junction, L.M.S.R., 4 miles.

#### KENT.

*Leybourne Grange Colony, West Malling.* 120 females, 180 males. Med. Supt., Dr. R. Fitzroy Jarrett. (Class A.) Malling, S.R., 2 miles.

\**Princess Christian's Farm Colony, Hildenborough.* 71 certified males, 68 certified females, 18 approved home cases. Managers, National Association for the Feeble-minded. Superintendent, Miss Pitman. (Classes A and D.) Tonbridge, 3 miles.

*Darenth Training Colony, near Dartford, Kent.* 2260 London cases only (both sexes). Managers, L.C.C. Mental Hospitals Committee. Res. Med. Supt., J. K. C. Laing, M.B., B.S., D.P.M. (Class B.) Dartford, S.R., 2 miles.

#### LANCASHIRE.

*Allerton Priory R.C. Special School, Woolton, Liverpool.* 123 female educable children. Cor. Manager, Rev. J. Bennett, 93, Shaw Street, Liverpool. Med. Officer, Dr. P. T. Garry. Supt., Sister, M. B. Pound. Station, Allerton. (Class A.)

*Calderstones, Whalley, near Blackburn.* 1364 males, 964 females. Feeble-minded, imbeciles, idiots, and moral defectives. Managers, Mental Deficiency Acts Committee, Lancashire Mental Hospitals Board, Preston. Res. Med. Supt., Frank A. Gill, M.D. (Class A.) Whalley, L.M.S., 1 $\frac{1}{2}$  miles.

*Dovecot Certified Institution, Knotty Ash, Liverpool.* 64 females. Supt., Miss F. E. Eyre. Med. Supt., Dr. McDonald. (Class A.) Broad Green, about  $\frac{1}{2}$  mile.

*Moss Side State Institution, Maghull, Liverpool.* 147 males and 153 females, over 16 years of age and of dangerous or violent propensities. Med. Supt., C. H. G. Gostwyck, M.B., F.R.C.P., D.P.M. Managers, The Board of Control, Caxton House West, Tothill St., S.W.1. (Class A.) Maghull, L.M. & S.R.,  $\frac{1}{2}$  miles.

\**Pontville R. C. Special School, Ormskirk.* 121 boys under 16. Mentally defective. Cor. Manager, Rev. J. Bennett, 93, Shaw Street, Liverpool. (Class A.)

*Royal Albert Institution, Lancaster.* 850 of both sexes. Managers, The Central Committee of the Royal Albert Institution, Lancaster. Res. Med. Supt., Dr. C. J. Henderson. Secretary, Samuel Keir. (Class A.) See also *Advt.*, p. 83

*Seaford House, Waterloo Road, Seaford, near Liverpool.* 21. 101 male, 134 female, feeble-minded children. Managers, Liverpool City Council, Liverpool. Res. Supt. in Charge, A. Armitage. (Class B.) Seaford station, L.M. & S.R.,  $\frac{1}{4}$  mile.

#### LEICESTERSHIRE.

*Leicester Frith, Groby Road, Leicester.* 150 males, 187 females. Supt., Miss N. Russam. Managers, City of Leicester Mental Deficiency Committee, Alliance Chambers, Horsefair Street, Leicester. (Class A.) Leicester, 2 miles.

#### LONDON.

*South Side Home, Streatham Common, S.W.16.* 80 females (London cases only). Managers, L.C.C. Mental Hospitals Committee. Res. Supt., Miss H. G. Hollyer. (Class A.) Streatham, S.R.,  $\frac{1}{2}$  mile.

*The Helping Hand Home, 16, Cathcart Hill, N.* 29 females. High-grade mental deficients. Supt., Miss M. M. Hodgetts. Med. Supt., Dr. Helen Gillespie. Managers Committee: Hon. Sec., Mrs. Geoffrey Russell, J.P., 17, Church Row, Hampstead, N.W.3. (Class A.) Tufnell Park Tube, 3 minutes.

*St. Teresa's, 97, Belmont Hill, Lewisham.* 120 females. Supt., Sister A. Friel. (Class A.)

*Fountain Mental Hospital, Tooting Grove, Tooting Graveney, S.W.17.* 670 low-grade unimprovable children (London cases only, of both sexes). Managers, L.C.C. Mental Hospitals Committee. Res. Med. Supt., J. Nicoll, M.D., C.M., D.P.H. (Class B.) Tooting Broadway, C. & S.L.R.  $\frac{1}{2}$  mile.

#### MIDDLESEX.

*All Souls' Special School, Field Heath House, Hillingdon.* 120 educable females under 16. Secretary, Westminster Diocesan Education Fund, Archbishop's House, Westminster, S.W.1. (Class A.)

*Bramley House, Clay Hill, Enfield.* 50 females. Managers, Middlesex County Council. Supt., Miss A. Swift. Vis. Med. Officer, Dr. Fleming. (Class A.) Gordon Hill,  $\frac{1}{4}$  miles.

*St. Raphael's Institution, The Butts, Brentford.* 60 females. Supt., Miss A. Dwyer. (Class A.) Brentford Southern Electric, 5 minutes' walk.

\**Walsham Home and Hostel, 64, St. Ann's Hill, Wandsworth.* 15 feeble-minded girls. Sec., Sister George, Church Army, 55, Bryanston Street, Marble Arch, W.1. (Class A.) Clapham Junction, 5 minutes by train.

*Normansfield, Teddington.* 150 males and females of all ages. Med. Supt., Dr. R. L. Langdon-Down. (Class C.)

See also *Advt.*, p. 85

\**Alexander House, 117, High Street, Uxbridge.* 24 females over 16. Vis. Med. Off., Dr. Black. Lay Supt., Miss A. B. Osell. (Class D.)

*Conifers, Teddington.* 22 females and 3 male children. Med. Supt., Dr. R. L. Langdon-Down. (Class D.)

*Trematon, Teddington.* 24 males. Med. Supt., Dr. R. L. Langdon-Down. (Class D.)

#### NORFOLK.

\**Heckingham Institution, Norfolk.* For both sexes. Supt., W. L. Hill. (Class A.)

#### NORTHUMBERLAND.

*Prudhoe Hall Colony, Prudhoe-on-Tyne.* 581 of both sexes. Med. Supt., G. McCoull, M.D. Supt., Miss N. M. Hawkes. High and Low Grades. (Class A.) Prudhoe station L. & N.E.R.

#### NOTTINGHAMSHIRE.

*Rampton State Institution, near Retford.* Both sexes of dangerous or violent propensities. 652 males, 499 females. Med. Supt., F. E. E. Schneider, M.D., D.P.M. Managers, The Board of Control, Caxton House West, Tothill Street, S.W.1. (Class A.)

#### SOMERSET.

\**House of Help (Bath Preventive Mission)* 112, Walcot Street, Bath. 66 females. Hon. Vis. Med. Off., Dr. D. L. Beath. Supt., Miss H. D. Stegeman. (Class A.)

*Stoke Park Colony, Leigh Court, Abbot's Leigh, nr. Bristol.* 260 females. Managers The Incorporation of National Institutions for Persons requiring Care and Control. (Class A.)

\**Rock Hall House, Combe Down, Bath.* 18 males, 20 females. Supt., Miss L. S. Davison. (Class A.)

\**Yatton Hall, Yatton, near Bristol* (ancillary premises to Sandhill Park). 76 of both sexes (65 under 16 years, 11 young women). Managers, Somerset County Council, Supt., Miss J. McGill. (Class A.)

*Sandhill Park, Bishop's Lydeard.* 161 females and 60 males, of 16 years and over, and 199 school children under Education Act. *Ancillary Institutions at West End House, Shepton Mallet*, females 129. *Cambridge House, Flax Bourton*, males 164, and *Yatton Hall, Yatton*, males 53, females 43. Managers, Somerset County Council. Med. Supt., Dr. T. A. Danby. (All Class A.) Bishop's Lydeard, 1 mile.

\**West End House, Shepton Mallet* (ancillary premises to *Sandhill Park*). 129 females of 16 years and over. Managers, Somerset County Council. Med. Supt., Dr. G. W. J. Mackay. Lady Supt., E. B. Stalker. (Class A.)

\**Cambridge House, Flax Bourton, Bristol* (ancillary premises to *Sandhill Park*). 194 males of 16 years and over. Managers, Somerset County Council. Supt., Mr. W. Lombard. (Class A.)

## STAFFORDSHIRE.

*New Cross Institution, Mental Wards, Wolverhampton.* 7 males, 5 females. Managers, County Borough Council of Wolverhampton. Supt., T. D. Rollinson. (Class B.)

*Sedgley Public Assistance Institution, Dudley, Staffordshire.* 50 males, 65 females. Med. Officer, S. W. Cummings. Managers, Staffordshire County Council. Master, P. Hopkin. (Class B.) Dudley, 1½ miles.

\**Stallington Hall, Blythe Bridge, Stoke-on-Trent.* 33 males, 44 females. Supt., Miss M. A. Cahill. (Class A.)

## SUFFOLK.

*Hamford Home, Ranelagh Road, Ipswich.* 22 high-grade females. Managers, Ipswich Corporation. Supt., Miss D. B. Miller. (Class A.)

\**St. Joseph's Home, The Croft, Sudbury.* 27 high-grade females. Lady Supt., Sister Catherine. (Class A.)

## SURREY.

\**Eagle House, London Road, Mitcham.* For females. Supt., Miss M. Blandford. (Class A.)

\**Ellen Terry National Home for Blind Defective Children, Wray Park Road, Reigate.* For both sexes. Matron-Supt., Miss E. M. Cooke. (Class A.)

*Farmfield, Horley, Surrey.* 141 males of criminal experience or intractable disposition (London cases only). Managers, L.C.C. Mental Hospitals Committee. Res. Supt. A. J. Oldfield. (Class A), Horley, 3 miles.

*Royal Earlswood Institution, Redhill.* 330 males, 270 females (including small boys). Res. Med. Supt., Dr. S. Langton, Sec., Mr. H. Stephens, 14, Ludgate Hill, E.C.4. (Class A.) See also Advt., p. 75

*The Manor, Epsom, Surrey.* 1292 (both sexes). (London cases only). Managers, L.C.C. Mental Hospitals Committee. Res. Med. Supt., E. S. Littelljohn, M.R.C.S., L.R.C.P. (Class A.) Epsom, S.R., 1 mile.

*Caterham Mental Hospital, Caterham, Surrey.* 2103 London cases only (both sexes). Managers, L.C.C. Mental Hospitals Committee. Res. Med. Supt., T. Lindsay, M.D., F.R.C.S., D.P.M. (Class B.) Caterham, S.R., 1½ miles.

## SUSSEX.

\**The Hermitage Training Home, Fairwarp, near Uckfield.* For females. Supt., Miss M. Walton. (Class A.)

\**Tubicell Farm, Jarvis Brook, near Crowborough.* For males only. Managers, The Guardianship Society, 8, Grand Parade, Brighton. Med. Director, Dr. S. E. Gill. Supts., Mr. and Mrs. T. Wells.

## WARWICKSHIRE.

\**Agatha Stacey Home, Rednal, near Birmingham.* 40 females. Non-Res. Med. Supt., Dr. C. Louis Hawkins. Dunedin, Barnet Green. Lay Supt., Miss D. O. Hall. (Class A.) Barnet Green, 3 miles.

*Coleshill Hall, near Birmingham.* 180 males, 240 females. Res. Med. Supt., Dr. H. Freize Stephens. (Class A.)

*Great Barr Park Colony, Great Barr, near Birmingham.* 315 males 341 females. Cot and chair cases, both sexes, 27. Res. Med. Supt., Dr. D. M. Macmillan. (Class A.) Great Barr, L.M.S., 2½ miles.

*Midland Counties Institution, Knowle, near Birmingham.* 200 males. Supt., S. H. Thornton. Med. Officer, J. O. Hollick, M.B. (Class A.) Knowle, G.W.R., 10 minutes.

*Monyhull Colony, Monyhull Hall Road, King's Heath, Birmingham.* 583 males, 660 females. Med. Supt., Dr. A. M. McCutcheon. (Class A.)

*Warwickshire Weston Colony, Weston-under-Weatherley, near Leamington Spa.* 32 males, 107 females. Supt., A. B. Lane. (Class A.)

## WILTS.

*Devizes Poor Law Institution.* 16 females, 32 males. Managers, Devizes Area Guardians Committee. Supt., S. Balsh-Ward. (Class B.)

*Public Assistance Institution, Senington, Trowbridge.* 22 males, 36 females. Managers, Trowbridge Area Guardians Committee. Supt., C. F. Dicey. (Class B.) Melksham, 2½ miles. Trowbridge, 3 miles.

## WORCESTERSHIRE.

*Besford Court Catholic Mental Welfare Hospital, Besford, near Defford.* 250 senior, 130 junior, males. Res. Manager, and Supt., Rev. P. F. M. McSwiney. (Class A.) L.M.S., Defford, 2 miles. G.W.R., Pershore, 4 miles.

YORKSHIRE.

*The Kepstorn Institution, Kirkstall, Leeds.* 40 adult females. Managers, Leeds City Council. Executive Officer, Mr. S. Wormald, 38, Park Square, Leeds. Matron, Miss A. Riley. (Class A.)

*Meanwood Park Colony, Meanwood, Leeds.* 163 males, 268 females. Managers, Leeds City Council. Executive Officer, Mr. S. Wormald, 27, Blundell St., Leeds 1. Med. Supt., Dr. Walter Lister, O.B.E. (part time non-resident). Matron, Miss C. Surtees Wilson. (Class A.) Leeds, 3 miles.

*Mid-Yorkshire Institution. Whitley, York.* 214 males. Managers, The Mid-Yorkshire Joint Board. Supt., Wilfred Lombard. (Class A.) Cattal, L. & N.E.R., 10 minutes.

CARMARTHENSHIRE.

*Pantglass Hall, Llanfynydd Road, Carmarthen.* For 117 females. Supt., Miss M. C. Treharne-Jones. (Class A.)

FLINT.

*Coed du Hall Certified Institution, Rhydyrnwym, near Mold, Flintshire.* For females. Supt., Miss M. P. Elder. Non-Res. Med. Supt., Dr. Arwel Thomas. (Class A.) Rhydyrnwym, L.M.S., 1 mile.

GLAMORGANSHIRE.

*\*Hensol Castle, Pontyclun, Glam.* 100 males. *Drymma Hall, Skewen, near Neath.* 79 females. Res. Med. Supt., Dr. E. Lewis. (Class A.)

STIRLINGSHIRE.

*The Royal Scottish National Institution, Larbert.* For 560 pupils of both sexes and all grades. Res. Med. Supt., T. R. C. Spence, M.C., M.B., Ch.B. (Classes A, C.)

INSTITUTIONS AND HOMES FOR INEBRIATES.

Those marked with an asterisk (\*) have not returned our form sent for correction.

LICENSED UNDER THE ACTS, 1879-1900.

The patient must sign a Form expressing a wish to enter the Home, before a magistrate. This can be done at the private residence of the patient, or at the retreat, if previous notice has been given. Two friends must also sign a declaration that they consider the patient an 'Inebriate' within the meaning of the Acts.

† NOTE—Ecclesfield, Staplehurst, is a Roman Catholic Religious Institution.

MALES ONLY.

HERTS.

*\*Dalrymple House, Rickmansworth.* Apply to Res. Med. Supt. Rickmansworth station, Joint G.C. and Metropolitan Railway,  $\frac{1}{2}$  mile; L.M. and S.R., 1 mile.

WARWICKSHIRE.

*Caldecote Hall, Nuneaton.* (C.E.T.S. Institution.) Res. Med. Supt., Alfred E. Carver, M.D. Nuneaton,  $2\frac{1}{2}$  miles. See also *Advt.*, p. 86

FEMALES ONLY.

KENT.

*Ecclesfield, Staplehurst.*† Med. Supt., Dr. A. M. Jamieson. Apply, Mother Superior. Staplehurst,  $1\frac{1}{4}$  miles.

SURREY.

*Spelthorne St. Mary, Thorpe, near Chertsey.* Apply to the Sister Superior, C.S.M.V. Med. Supt., Dr. W. Dale. Virginia Water, 1 mile.

ANTRIM.

*\*The Lodge Retreat, Dundela Avenue, Holywood Road, Belfast.* Med. Attend., Muriel Price, M.B., D.P.H. Matron, Miss E. M. Watt. Stations 20-30 minutes by tram.

UNLICENSED HOMES.

DEVON.

*\*Bay Mount, Paignton.* Small private home for both sexes. Res. Med. Supt., Dr. Stanford Park.

KENT.

*Old Hill House Ltd., Chislehurst.* Med. Supt., Dr. Norman Vernon, M.R.C.S., L.R.C.P. Chislehurst station, 4 minutes.

SUFFOLK.

*\*Norwood Sanatorium Ltd., Rendlesham Hall, Woodbridge.* Wickham Market station. Telephone and Telegrams: Wickham Market 16. See also *Advt.*, p. 92

## SANATORIA FOR TUBERCULOSIS PULMONARY AND NON-PULMONARY

Those marked with an asterisk (\*) have not returned our form sent for correction.

### BEDFORDSHIRE.

*Danceswood Sanatorium, Woburn Sands.* For indigent Jewish patients. Med. Off., Dr. W. A. Burnes. Hon. Sec., Miss Senesinger, 24, Queen's Court, Queen's Road, W.2. Woburn Sands (L.M. & S.R.) 1½ miles.

*The Bedfordshire County Sanatorium, Mogerhanger Park, Sandy.* Med. Supt., C. G. Welch, M.D. Sandy station, 2½ miles.

### CAMBRIDGESHIRE.

*Papworth Village Settlement, Cambridge.* Med. Director, Sir Pundrill Varrier-Jones, M.A., F.R.C.P. Huntingdon station, 6 miles; Cambridge, 12 miles.

### CHESHIRE.

*\*Baguley Sanatorium, Baguley.* For Manchester cases. Res. Med. Supt., H. G. Trayer, M.B., D.P.H. Baguley, 1½ miles.

*Cleaver Sanatorium for Children, Heswall.* 260 beds. Med. Supt., J. B. Yeoman, M.D. Res. Med. Officer, Margaret Mulvein, M.B., Ch.B. Matron, Miss D. Kelsall. Heswall, 1½ miles.

*\*East Lancashire Tuberculosis Colony and Sanatorium, Barrowmore Hall, Gt. Barrow, Chester.* Occupational treatment. Res. Med. Supt., Dr. E. L. Sandiland. Chester, 6 miles.

*Nub Top Sanatorium, Marple.* For residents of Salford only. Res. Med. Supt., H. M. Fleming, M.D. Rosehill (Marple) station, ½ mile.

### CORNWALL.

*The Cornish Riviera Sanatorium, Rosehill, Penzance.* Med. Supt., Dr. F. Chown. Penzance, 1½ miles.

### CUMBERLAND.

*Blencathra Sanatorium, Threlkeld.* Res. Med. Supt., Dr. W. Goodchild. Threlkeld, L.M. & S.R., 2 miles.

See also Advt., p. 89

### DERBYSHIRE.

*Derbyshire County Sanatorium, Walton, near Chesterfield.* Med. Supt., A. N. Robertson, M.D. Chesterfield, 1½ miles.

### DEVONSHIRE.

*Devon and Cornwall Sanatorium, Didworthy, South Brent.* For consumptives of the two counties. Sec., S. Carlile Davis, Esq., M.B.E., 5, Princess Square, Plymouth. Res. Med. Off., Dr. A. T. Bettinson. Brent, G.W.R., 2 miles.

*Devon County Sanatorium, Hawkmoor, Bovey Tracey.* Res. Med. Supt., Dr. R. L. Midgley. Bovey, 3 miles; Lustleigh, 2 miles.

*\*"Whitecliff" Tuberculosis Hospital, Torquay.* Med. Supt., Dr. R. L. Midgley. Torre station, 2 miles.

### DURHAM.

*\*Felix House, Middleton St. George, Darlington.* Res. Med. Supt., C. S. Steavenson, M.B. Dinsdale, L. & N.E.R., 3 minutes.

*\*Sanatoria of the Durham County Council: Earls House Sanatorium, near Durham.* Med. Supt., J. Menzies Cormack, M.B., Ch.B., D.P.H. Holywood Hall, Wolsingham. Res. Med. Supt., J. W. Gray, M.D. Wolsingham station, L. & N.E.R., 1½ miles. Seaham Hall, near Seaham Harbour. Res. Med. Supt., Dr. W. C. Pinkney.

*Sanatoria of the Durham County Consumption Society.* Sec., Mr. F. Forrest, 54, John Street, Sunderland. Vis. Med. Supt., Dr. G. S. Robinson. For men and boys: *Horn Hall, Stanhope.* Med. Off., Dr. J. O'Hara. Stanhope station, 1 mile. For women and children: *The Leazes House, Wolsingham.* Med. Off., Dr. J. F. McConchie. Wolsingham station, ½ mile.

### ESSEX.

*\*Black Notley Sanatorium, Braintree.* Res. Med. Supt., Dr. M. C. Wilkinson. Sec., Clerk of County Council, Shire Hall, Chelmsford. Cressing, 1 mile.

*Merivale Sanatorium, Sandon, near Chelmsford.* Res. Med. Supt., H. N. Marrett, M.R.C.S., L.R.C.P. Chelmsford station, L. & N.E.R., 3½ miles.

*West Ham Sanatorium, Dayenham, for adults; Langdon Hills Sanatorium, Laindon, for children.* Med. Supt., Dr. G. M. Mayberry.

### GLOUCESTERSHIRE.

*Frenchay Park Sanatorium and Orthopaedic Hospital for Bristol Children, Frenchay, near Bristol.* Res. Med. Supt., Dr. C. J. Campbell Fail. Under the control of the M.O.H. Dept., Bristol. Staple Hill station, L.M. & S.R., 1½ miles.

*\*Salterley Grange Sanatorium, near Cheltenham.* Res. Med. Supt., Dr. D. J. Peebles. Leekhampton, 2½ miles; Cheltenham, 3½ miles.

*Standish House Sanatorium, Stonehouse.* Res. Med. Supt., W. A. Dickson, M.D., M.R.C.P.Ed., F.R.C.S. Stonehouse, G.W.R., 1½ miles; L.M. & S.R., 2½ miles.

*The Cotswold Sanatorium, Crankham, Gloucester.* Res. Med. Supt., Geoffrey A. Hoffman, B.A., M.B., T.C. (Dub.); Res. Asst. Phys., Margaret A. Harrison, M.B., B.S. (Lond.); Pathol., Edgar N. Davey, M.B., B.Ch.; Cons. Laryng., Cassidy de W. Gibb, F.R.C.S. Edin.; Cons. Dental Surg., George V. Saunders, L.D.S., R.C.S., Lond. Cheltenham, Gloucester, or Stroud, all 8 miles. Phone, Witcombe 81 and 82.  
See also *Advt.*, p. 89

## HAMPSHIRE.

*Hants County Council Sanatorium, Chandler's Ford.* Res. Med. Supt., Dr. W. J. Hart. Chandler's Ford, 1 mile.

*Linford Sanatorium, Ringwood.* Res. Med. Supts., A. de W. Snowden, C.B.E., M.A., M.D., B.Ch.—Dr. A. G. E. Wilcock. Ringwood, 3 miles. See also *Advt.*, p. 89

*Royal National Hospital for Consumption, Ventnor, Isle of Wight.* Med. Supt. Dr. G. Oliver Hempson. Sec., H. R. Rowe, 18, Buckingham Street, Strand, W.C.2. See also *Advt.*, p. 89

*Royal National Sanatorium for Consumption and Diseases of Chest, Bournemouth.* Sec., A. G. A. Major. Sen. Med. Off., D. A. Hutcheson, M.D. Bournemouth Central, 1½ miles; Bournemouth West, ½ mile.

*The Firs Home, Bournemouth* (for advanced cases of consumption). Hon. Sec., Col. R. F. Anderson. Hon. Treas., A. J. Drewe, Esq. Hon. Med. Offs., C. P. Woodstock, M.D., and L. R. Olver, M.B., F.R.C.S. Lady Supt., Miss Goodrich. Bournemouth Central, ½ mile.

## HERTS.

*Hertfordshire County Sanatorium, Ware Park, Ware.* Res. Med. Supt., Herbert Sharpe, M.R.C.S., L.R.C.P. Ware, 2 miles; Hertford, 2 miles.

*Sanatorium of the National Children's Home and Orphanage, Harpenden.* Vis. Phys., T. N. Kelynaek, M.D., J.P. and A. V. Kelynaek, M.R.C.S., L.R.C.P. Principal, Rev. John H. Litten, Highbury Park, London, N.5. Harpenden station, L.M. & S.R. See also *Advt.*, p. 86

## KENT.

*\*Grosvenor Sanatorium, Ashford.* Res. Med. Supt., J. A. Milne, M.B., Ch.B., D.P.H. Ashford Junction, 2 miles.

*Sanatorium of "National Association for the Establishment and Maintenance of Sanatoria for Workers suffering from Tuberculosis," Benenden.* Res. Med. Supt., Dr. C. E. H. Anson. Biddenden, 3 miles.

## LANCASHIRE.

*Broadgreen Sanatorium, Edge Lane Drive, Liverpool, 14.* Res. Med. Supt., Dr. F. O. Thomas. Broadgreen station, ½ mile.

*Fazakerley Sanatorium, Longmoor Lane, Liverpool, 9.* Res. Med. Supt., Walter Crane, M.D., D.P.H. Fazakerley station, ¼ mile.

*High Carley Sanatorium* (including *Oubas House Children's Sanatorium*), *Ulverston.* Res. Med. Supt., G. Leggat, M.B., Ch.B., D.P.H. Ulverston, 2 miles.

*Liverpool Sanatorium for Consumptives, Delamere Forest, Frodsham.* Sec., W. H. Rayner, Liverpool Hospital for Consumption, Mount Pleasant, Liverpool. Res. Phys., Alfred Adams, M.D., D.P.H. Frodsham or Helsby, L.M. & S. & G.W.R. 3½ miles.

*Manchester Hospital for Consumption and Diseases of Throat and Chest, Hardman St., Deansgate, Manchester* (Out-patients). Sec., W. Hunt. *St. Anne's Home, Bowdon, Cheshire* (In-patients, Ear, Nose and Throat Dept.). Res. Med. Off., Dr. N. F. Kirkman. *Crossley Sanatorium, Delamere, Cheshire.* Res. Med. Off., Dr. G. Heathcote. (For poor and working classes, after personal examination at Manchester.)

*Strinesdale Sanatorium, Oldham.* Med. Supt., Dr. J. B. Wilkinson. Oldham, 2 miles.

*Wilkinson Sanatorium for Consumptives, Sharples, Bolton.* Med. Off., Dr. W. Rolland. Bolton, 2 miles.

## LINCOLNSHIRE.

*Holland Sanatorium, Boston.* Med. Supt., W. G. Booth, M.D., D.P.H. Boston, 1 mile.

## LONDON.

*City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.2.* Apply Secretary. 'Bus, Tram or Rail, L.N.E.R., Cambridge Heath.

*\*Royal Chest Hospital, 231, City Road, E.C.1* (Section of the Royal Northern Group of Hospitals). Res. Phys., Dr. I. O. Thorburn. Apply, Secretary.

*Clare Hall County Sanatorium, South Mimms, Barnet.* Res. Med. Supt., F. A. H. Simmonds, M.A., M.B., D.P.H. Sec., The Clerk, Guildhall, Westminster, S.W.1. Potter's Bar station, 3 miles.

*Middlesex County Sanatorium, Harefield.* Res. Med. Supt., Dr. J. R. McGregor. Sec., Clerk to the County Council, Guildhall, Westminster, S.W.1. Denham station, 3 miles.

## NORFOLK.

*\*Kelling Sanatorium, Holt.* Res. Med. Supt., Dr. J. I. W. Morris. Holt station, 1½ miles.

*Mundesley Sanatorium, Mundesley.* Res. Med. Supt., S. Vere Pearson, M.D., E. C. Wynne-Edwards, M.B., F.R.C.S. (Edin.), and Geo. H. Day, M.D. (Cantab.), Mundesley, 1 mile. See also *Advt.*, p. 99.

*The Children's Sanatorium, Incorporated, near Holt, Norfolk.* Vis. Med. Off., Dr. H. F. Skrimshire. Hon. Sec., Mrs. C. Munro, Carnegie House, 117, Piccadilly, W.1. Holt, 1 mile.

#### NORTHAMPTONSHIRE.

*\*Creton Sanatorium, Creton, Northampton.* Res. Med. Supt., E. T. W. Starkie, M.A., B.Ch., M.R.C.S., L.R.C.P. Brixworth, L.M. & S.R., 3 miles.

#### NORTHUMBERLAND.

*Children's Sanatorium, Stanington.* Res. Med. Supt., Dr. Elsie F. Farquharson, M.A. Matron, Miss I. Campbell. Stanington station, 2 miles.

*The Newcastle-on-Tyne Sanatorium, Barrasford.* Res. Med. Supt., Dr. C. G. R. Goodwin. Barrasford, L. & N.E.R., 4 miles.

*Woolley Sanatorium, Hexham.* Res. Med. Supt., Dr. R. Cunningham. Corbridge, 5 miles.

#### NOTTINGHAMSHIRE.

*Ransom Sanatorium, Rainworth, near Mansfield (Notts County Council).* Res. Med. Supt., Dr. C. L. Crawford Crowe. Mansfield, 3 miles. L.M.S. or L.N.E.R.

#### OXFORD.

*Berks and Bucks Joint Sanatorium, Peppard Common.* Res. Med. Off., Dr. Esther Carling. Reading, 6½ miles.

#### SHROPSHIRE.

*Cheshire Joint Sanatorium, Market Drayton, Salop.* Res. Med. Supt., Dr. Peter W. Edwards. Market Drayton, 4½ miles.

*King Edward VII Memorial Sanatorium, Shirlett, near Broseley.* Res. Med. Supt., Dr. F. T. Turner. Much Wenlock station, 3 miles.

#### SOMERSETSHIRE.

*\*Nordrach-upon-Mendip, Blagdon, near Bristol.* Res. Med. Supt., Gordon Tippet, M.B., M.R.C.S., L.R.C.P.

*St. Michael's Home for Pulmonary Tuberculosis, Azbridge.* For members of the Church of England. Med. Off., Dr. St. John Kemm. Apply, Sister-in-charge.

#### SUFFOLK.

*Normanston Hospital, Oulton Broad, Lowestoft.* Med. Supt., M. A. MacDonald, M.C., M.B., Ch.B. Oulton Broad, N., ¼ m.

*East Anglian Sanatorium, and Maltings Farm Sanatorium* for poorer men and women patients, and *East Anglian Children's Sanatorium, Nayland.* Med. Supt., Dr. Jane Walker, Ch.H., J.P., and Dr. G. E. Soltau, J.P. Bures station, L.N.E.R., 3½ miles; Colchester, 8 miles.

#### SURREY.

*\*Brompton Hospital Sanatorium, Frimley.* Res. Med. Supt., Dr. R. C. Wingfield. Frimley station, 2 miles.

*\*Burrow Hill Sanatorium Colony, St. Catherine's Road, Frimley.* For youths between 14 and 19 years. Res. Med. Supt., Dr. Alex. Hill Macpherson. Frimley station, 1½ miles.

*Church Army Sanatorium for Pre-tubercular Boys, Heath End.* Ages 8 to 15. Med. Off., Dr. W. B. Vaile. Sec., Capt. Hanmore, Church Army, 55, Bryanston Street, W.1. Aldershot, 1½ miles.

*Prior Place Sanatorium, Heatherside, Camberley.* Res. Med. Supt., Dr. H. O. Blanford. Camberley, 2 miles.

*Surrey County Sanatorium, Milford.* Res. Med. Supt., Dr. R. J. Allison. Milford station, S.R., ½ mile.

#### SUSSEX.

*Darvell Hall Sanatorium, Robertsbridge (East Sussex County Council).* Res. Med. Off., Dr. J. R. Dingley. Robertsbridge, S. R., ¾ mile.

*Eversfield Chest Hospital, West Hill, St. Leonards.* Med. Supt., Dr. V. St. George Vaughan. West St. Leonards, S.R.; West Marina, S.R., within 5 minutes' walk.

*Fairlight Sanatorium, Hastings,* in connection with Margaret Street Hospital for Consumption (for Out-Patients), 26, Margaret St., W. Sec., Miss D. M. Fenn. Med. Supt., Dr. N. F. Stallard. Hastings.

*\*King Edward VII Sanatorium, Midhurst.* Res. Med. Off., Geoffrey O. Todd, M.B., Ch.M., M.R.C.P.; 1st Asst., Edward M. Turner, M.R.C.S., L.R.C.P.; 2nd Asst., Hugh Ramsay, M.B., B.S., M.R.C.S. L.R.C.P. Midhurst, 4 miles.

*Municipal Sanatorium, Brighton (for Brighton townfolk only—pulmonary and joints).* Med. Supt., Dr. Duncan Forbes, M.O.H., Royal York Buildings, Brighton. Brighton Central station, 1½ miles.

*Rudgwick Sanatorium, Rudgwick.* Vis. London Phys., Dr. Annie McCall. Rudgwick station, 7 minutes.

#### WARWICKSHIRE.

*City Sanatorium, Yardley Green Road, Small Heath, Birmingham.* Res. Med. Supt., Dr. G. B. Dixon. Stechford, L.M. & S.R.

#### WESTMORLAND.

*Westmorland Sanatorium, Meathop, Grange-over-Sands.* Res. Med. Supt., J. Munro Campbell, M.B., Ch.B., D.P.H. Grange-over-Sands station, 2 miles.

#### WILTS.

*Winsley Sanatorium, Winsley, near Bath.* 134 beds, 17 for "paying" patients. Res. Med. Off., A. J. P. Alexander, M.D. (Belf.), M.R.C.P. (Ire.), M.R.C.P. (Lond.). Limpley Stoke station, 1 mile.



## WORCESTERSHIRE.

*King Edward VII Memorial Sanatorium, Knightwick, near Worcester.* Free to County patients. Res. Med. Supt., Dr. H. Gordon-Smith. Knightwick,  $1\frac{1}{2}$  miles.

*Prestwood Sanatorium, Stourbridge.* Res. Med. Supt., Dr. J. Stevenson, M.C. Stourbridge, 3 miles.

*Romsley Hill Sanatorium, Halesowen.* Res. Med. Supt., Dr. D. J. Peebles. Birmingham Corporation Sanatorium. Halesowen,  $4\frac{1}{2}$  miles.

## YORKSHIRE.

*Bierley Hall Sanatorium, Bierley Lane, Bradford.* For 60 men and women. Res. Med. Supt., Dr. W. S. Burnet. Bradford, 3 miles.

*\*Eastby Sanatorium for Boys, Skipton.* Res. Med. Supt., Dr. Catherine Arnott. Embsay station, 2 miles.

*\*Eldwick Sanatorium, Bingley* (West Riding County Council school for plithisical children). Med. Off., Dr. Margaret S. Sharp. Bingley station, 2 miles.

*Gateforth Sanatorium, near Selby, Leeds.* Res. Med. Supt., Dr. A. C. Meek. *Leeds Sanatorium for Consumptives, Killingbeck;* and *Children's Sanatorium, "The Hollies," Westwood, Leeds.* Hambleton,  $1\frac{1}{2}$  miles, L.N.E.R.

*Middleton Sanatorium, near Ilkley.* Res. Med. Supt., Dr. Raeburn. Ilkley, 2 miles. Ben Rhydding,  $1\frac{1}{2}$  miles.

*The City Sanatoria, Sheffield; Crimicar Lane Sanatorium* (males); *Commonside Sanatorium* (females); *Winter Street Sanatorium* (both sexes); *Nether Edge Sanatorium* (both sexes and children). Clinical Tuberculosis Off., H. Midgley Turner, M.D., D.P.H. Sheffield, L.M. & S.R.,  $4\frac{1}{2}$  miles.

*Wensleydale Sanatorium, Aysgarth.* Physicians, W. N. Pickles, M.D., B.S. and A. F. T. Ord, M.B., Ch.B. Aysgarth,  $\frac{1}{2}$  mile, via Northallerton, L. & N.E.R., and Garsdale Junction, L.M. & S.R.

See also Advt., p. 91

## ANGLESEY.

*Penhysgyn-y-Gors Sanatorium for Children, Menai Bridge* (King Edward VII Welsh National Memorial Association). Med. Off., Dr. V. Emrys Jones. Matron, Mrs. MacAnley. Menai Bidge, 3 miles.

## CARMARTHENSHIRE.

*\*West Wales Sanatorium, Llanbyther.* The Welsh National Memorial to King Edward VII. Res. Med. Supt., Dr. Henry A. Ross. Llanybyther station, 3 miles.

## CARNARVONSHIRE.

*Pendyffryn Hall Sanatorium, Penmaen-mawr.* Res. Phys., Dennison Pickering, M.D. (Camb.) and J. W. Costello, M.D., F.R.C.S. Penmaenmawr, L.M. & S.R.,  $1\frac{1}{2}$  miles.

See also Advt., p. 90

## DENBIGHSHIRE.

*Abergele Sanatorium.* For Manchester cases (children and adults). Med. Supt., J. E. Geddes, M.D. Matron, Miss E. J. Knowles. Steward, L. H. Alderott. Abergele, 2 miles.

*Vale of Clwyd Sanatorium, Llanbedr Hall, Ruthin.* Res. Med. Supt., H. Morriston Davies, M.D. Ruthin station, 2 miles.

See also Advt., p. 91

## GLAMORGANSHIRE.

*Adelina Patti Tuberculosis Hospital, "Craig-y-nos," Pen-y-cae, Swansea.* Res. Med. Supt., Dr. L. R. Clark. Craig-y-nos, 2 miles.

## ABERDEENSHIRE.

*Tor-na-Dee Sanatorium, Murtle.* Res. Med. Supt., Dr. J. M. Johnston. Murtle,  $\frac{1}{2}$  mile.

See also Advt., p. 91

## ANGUS.

*Sillaw Sanatorium, Auchterhouse, near Dundee.* 80 beds for children. (In connection with Dundee Royal Infirmary.) Med. Supt., H. J. C. Gibson, M.D. Vis. Phys., W. E. Foggie, D.S.O., M.D. Vis. Surg., R. C. Alexander, F.R.C.S. Asst. Vis. Surg., J. J. Robb, M.C., F.R.C.S. Matron, Miss Ellen Norris. Sec., W. F. Ferguson. Auchterhouse station,  $1\frac{1}{2}$  miles.

## ARGYLLSHIRE.

*\*Argyll County Sanatorium, Benwoulin, Oban.* 40 beds. Vis. Med. Off., Duncan MacDonald, J.P., M.D., M.B., C.M.

## AYRSHIRE.

*Ayrshire Sanatorium, Glenafton, New Cumnock.* Res. Med. Supt., E. E. Prest, M.D. New Cumnock,  $2\frac{1}{2}$  miles.

## EAST LoTHIAN.

*East Fortune Sanatorium, East Fortune.* Res. Med. Supt., Chas. Cameron, M.D. East Fortune,  $\frac{1}{2}$  mile.

## DUMFRIESSHIRE.

*\*St. Fechan's Sanatorium, Ecclefechan, by Lockerbie.* For Boys. Res. Med. Off., Dr. F. A. Collington. Ecclefechan station, 1 mile.

## FIFESHIRE.

*Sanatorium for Tuberculosis, Kirkcaldy.* Med. Supt., Dr. G. W. McIntosh. Sec., The Town Clerk. Kirkcaldy, 1 mile.

## INVERNESS-SHIRE.

*Grampian Sanatorium, Kingussie.* Med. Supt., Felix Savy, M.D., J.P. Kingussie,  $\frac{1}{2}$  mile.

*Inverness-shire Sanatorium, Invergarry, Aberchelder.* Med. Supt., J. Kirtton, M.C., M.A., M.D. Aberchelder, 2 miles.

## PEEBLES SHIRE.

*Manor Valley Sanatorium, Peebles.* Med. Off., W. M. Martin, M.B., M.R.C.P.E. Peebles, 4 miles; Lyne,  $\frac{1}{2}$  miles.

## RENFREWSHIRE.

*Consumption Sanatorium of Scotland, Bridge of Weir.*—Res. Med. Supt., E. J. Peill, M.B., Ch.B., F.R.C.S.E. Sec., Wm. A. Findlay. Bridge of Weir, 2 miles.

## ROSS SHIRE.

*\*Seaforth Sanatorium, Maryburgh.* Med. Off., Dr. W. McLean.

## ANTRIM.

*Belfast Municipal Sanatorium, Whiteabbey.* Res. Med. Supt., P. S. Walker, M.B., Ch.B., D.Sc., D.P.H. Whiteabbey, 50 yards.

*Forster Green Hospital for Consumption and Chest Diseases, Fortbrida, Belfast.* Med. Supt., B. R. Clarke, M.D. Sec., J. Osborne, 99-103, Scottish Provident Buildings, Belfast. Belfast, 2 miles.

## CORK.

*Cork County and City Sanatorium, Heatherside, Buttevant.* Res. Med. Supt., Dr. R. Ahern. Buttevant, G.S. & W.R., 6 miles.

## DOWN.

*\*Rostrevor Sanatorium, Warrenpoint.* Phys., Dr. J. A. O'Tierney. Apply Secretary.

## DUBLIN.

*\*Peamount Sanatorium, Newcastle, Dublin.* Res. Med. Supt., A. Barry, F.R.C.P.I. Lucan, 2 miles.

## WICKLOW.

*The Royal National Hospital for Consumption for Ireland, Newcastle, Wicklow.* Res. Med. Off., C. Denys Hanan, M.D. G.S. Rlys. to Newcastle, Co. Wicklow, 2 miles.

## SWITZERLAND.

*Montana Hall (The British Sanatorium), Montana-sur-Sierre.* Res. Med. Supt., Hilary Roche, M.D., M.R.C.P. Nearest station Montana-sur-Sierre.

See also *Advt.*, p. 92

*\*Park Sanatorium (formerly Sanatorium Turban), Davos-Platz.* Res. Med. Supt., F. Bauer, M.D. Davos-Platz, 10 minutes.

See also *Advt.*, p. 87

*\*The Schatzalp Sanatorium, Davos-Platz.* Res. Med. Supt., Edward C. Neumann, M.D. Davos-Platz station and Schatzalp funicular.

See also *Advt.*, p. 93

## HYDROPATHIC ESTABLISHMENTS.

Those marked with an asterisk (\*) have not returned our form sent for correction.

## CHESHIRE.

*Hoylake Hotel (late West Kirby Hydro), West Kirby.* Telephone: Hoylake 86. Kirby Park station, 5 minutes. Apply Manageress. See also *Advt.*, p. 104

## DERBYSHIRE.

*Rockside Physiotherapeutic Establishment, Matlock.* Cons. Phys., Dr. C. R. L'Estrange Orms, M.R.C.P. (Lond.). Matlock, L.M. & S.R.,  $\frac{1}{2}$  mile. See also *Advt.*, p. 99

*Smedley's Hydro, Matlock.* Resident and Vis. Physicians. Matlock station,  $\frac{1}{2}$  mile: omnibus. See also *Advt.*, p. 99

## GLOUCESTERSHIRE.

*The Bristol Hydropathic and Electrotherapeutic Establishment, College Green, Bristol.* Res. Phys., A. T. Spoor, M.A., M.R.C.S., L.R.C.P. Res. Med. Supt., W. J. Spoor, M.B., M.R.C.S.

## HAMPSHIRE.

*\*The Bournemouth Hydro, 10 Durley Gardens, Bournemouth West.* Res. Med. Supt., L. T. Rose-Hutchinson, M.D. Bournemouth West station,  $\frac{1}{2}$  mile.

See also *Advt.*, p. 99

*Linden Hall Hydro, Bournemouth.* Proprietors, The Exton Hotels Co. Ltd.

## LANCASHIRE.

*Kenworthy's Hydropathic, Southport.* Res. Phys., Dr. R. G. Clements, M.D., D.P.H., F.R.C.S. Chapel Street or Lord Street stations.

*\*Smedley Hydro-Hotel, Southport (Birkdale Park).* Southport or Birkdale stations, 5 minutes.

## LEICESTERSHIRE.

*Leicester Hydro Establishment, Museum Square, Leicester.* Prof. Dr. T. Timson, D.Sc., F.P.C., London. L.M. & S.R., 3 minutes.

## WILTSHIRE.

*\*West of England Hydropathic, Limpley Stoke, near Bath.* Apply the Secretary.

## YORKSHIRE.

*Craiglands Hydro, Ilkley.* Res. Phys., Maurice R. Dobson, O.B.E., M.B., B.S., L.R.C.P., M.R.C.S.

See also *Advt.*, p. 99

*\*Harlow Manor Hydro, Harrogate.* Manageress, Mrs. Baxter. Harrogate station, 1 mile.

*Cairn Hydropathic Company Ltd., Ripon Road, Harrogate.* Apply, Manager. Harrogate station,  $\frac{1}{2}$  mile.

*The Harrogate Hydropathic Company Ltd., Harrogate (Medical Baths). Manager, Morton Chance. Harrogate station,  $\frac{1}{2}$  mile.*

MORAYSHIRE.

\**Cluny Hill Hydropathic, Forres. Vis. Phys., Dr. John C. Adam. Forres, 1 mile.*

PEEBLESHIRE.

\**Peebles Hotel-Hydropathic, Peebles. Med. Supts., Drs. A. Temple and G. E. Ord. Peebles L.M. & S.R. & L. & N.E.R.,  $\frac{1}{2}$  mile.*

PERTHSHIRE.

\**Strathearn Hydro, Crieff. Res. Med. Supt., T. Gordon Meikle, M.B., C.M. Crieff station, 1 mile; Perth 17 miles.*

CORK.

*St. Ann's Hill Hydropathic, St. Ann's Hill, near Blarney, Cork. Res. Phys., Dr. R. H. Barter. Blarney North, 3 miles; Blarney South,  $\frac{1}{2}$  mile.*

NURSING ASSOCIATIONS AND INSTITUTIONS FOR NURSES

Those marked with an asterisk (\*) have not returned our form sent for correction.

LONDON.

\**Cavendish Temperance Male Nurses' Corporation Ltd., 54, Beaumont St., W.1. (23, Upper Baggot St., Dublin; 28, Windsor Terrace, Glasgow; and 176, Oxford Road, Manchester.) See also Advt., p. 81*

*Male Nurses' Association, 29, York Street, Baker Street, W.1. Sec., W. J. Hicks. See also Advt., p. 80*

*New Mental Nurses' Co-operation, 139, Edgware Road, London, W.2. Lady Supt., Miss Eva R. Crook. See also Advt., p. 76*

*The Nurses' Association, 29, York Street, Baker Street, W.1. Sec., W. J. Hicks; Supt., Mrs. Millicent Hicks.*

*See also Advt., p. 80*  
\**The Temperance Male and Female Trained Nurses' Co-operation, 45, Beaumont Street, W.1. Sec., H. S. Sturgess. See also Advt., p. 79*

YORKSHIRE.

*The Retreat, Trained Nurses' Department, York. Apply to the Matron.*

*See also Advt., p. 79*

PRIVATE HOMES FOR INVALIDS, MATERNITY HOMES, AND INSTITUTIONS FOR SPECIAL CARE AND TREATMENT.

Those marked with an asterisk (\*) have not returned our form sent for correction.

CHESHIRE.

*The David Lewis Colony, Alderley Edge (for sane epileptics), and Colthurst House School (for epileptic boys and girls). Res. Director, Richard Handley, M.B., D.P.M. Alderley Edge, 3 miles.*

*See also Advt., p. 83*

DEVONSHIRE.

*Ockenden Convalescent Home, Warren Road, Torquay. Hon. Med. Off., Eric Catford, M.R.C.S., L.R.C.P. Lady Supt., Miss Glover. Torro and Torquay stations, 1 mile.*

GLOUCESTERSHIRE.

*Dorset House, Clifton Down, Bristol. Functional nervous disorder—ladies and girls. Apply, Elizabeth Casson, M.D., D.P.M. See also Advt., p. xlv*

HERTS.

*The Archer Nerve Training Colony, Langley Rise, Ltd., King's Langley. (For functional nervous disorders). Vis. Physicians. Apply, Secretary. King's Langley (L.M. & S.R.), 1 mile.*

*See also Advt., p. 85*

LANCASHIRE.

*Home for Epileptics, Maghull, Liverpool, (for sane epileptics), and Chilton Home (certified as a special school for 82 epileptic children). Med. Officer, C. V. H. Nesbitt, M.D. Asst. Med. Off., R. G. R. Burrows, M.B. Sec., C. E. Grisewood, A.C.A., 20, Exchange Street East, Liverpool, 2.*

*See also Advt., p. 79*

LONDON.

\**Caerthillian Maternity Home, 85 and 87, Fordwych Road, Cricklewood, N.W.2. Matron, Miss E. Wyatt. Kilburn Brondesbury, Metropolitan Rly., 5 mins.*

\**Institute of Ray-Therapy and Electro-Therapy, 152-154, Camden Road, N.W.1. Hon. Med. Director, William Beaumont, M.R.C.S., L.R.C.P. Hon. Sec., Winifred Beaton, M.A.*

*Swedish Institute and Clinique, 108, Cromwell Road, S.W.7. For Massage, Medical Electricity, and Medical Gymnastics. Gloucester Road (Dist. Met. and Piccadilly Tube), 2 minutes. Phone, West 1010. See also Advt., p. 81*

*Woodside Hospital, Woodside Avenue, Muswell Hill, N.10.* (St. Luke's Foundation.) For functional nervous disorders. Physician in charge, Noel G. Harris, M.D., D.P.M. See also *Advt.*, p. 76

## MIDDLESEX.

*Borden House, Harrow-on-the-Hill* (for functional nervous disorders). Med. Supt., T. S. Rippon, O.B.E., M.R.C.S., L.R.C.P. Sudbury Hill, Harrow, L. & N.E.R., 15 mins. walk. See also *Advt.*, p. 85

*\*Oskey Grove Ltd., Oskey Grove, Hatch End.* For early mental conditions in both sexes. Res. Phys., Dr. Margherita M. Lilley, Hatch End (L.M. & S.R. & Bakerloo), 1 mile.

## SOMERSETSHIRE.

*Lansdown Hospital and Nursing Home, Bath.* For gout, rheumatism, and physical infirmities. Phys., Dr. F. Wells-Beville and Dr. J. Stanley Ellis, L.M. & S.R. or G.W.R. stats., 1 mile. See also *Advt.*, p. 78

## CARNARVONSHIRE.

*\*The Dr. Garrett Memorial Home for Convalescent Children, Morfa Drive,*

*Conway.* For boys and girls. 200 beds (86 open-air). Proprietress, Mrs. C. E. M. Garrett, Conway, L.M. & S.R.,  $\frac{3}{4}$  mile. See also *Advt.*, p. lii

## DENBIGHSHIRE.

*Ruthin Castle, Ruthin.* Private Hospital for Internal Diseases. Senior Phys., E. I. Spriggs, M.D., F.R.C.P. Ruthin,  $\frac{1}{4}$  mile. See also *Advt.*, p. li

## PERTHSHIRE.

*Gilgal Hospital, Perth.* For neuro-pathic and psychopathic disorders. Phys. Supt., W. D. Chambers, M.A., M.D., F.R.C.P.E. See also *Advt.*, p. 85

## FRANCE.

*Clinique Médicale du Château de Garches, Garches, near Paris.* Nervous disorders, nutrition, etc. Director, Dr. Garand. See also *Advt.*, p. lii

*\*"La Colline," Saint-Antoine-Nice, France.* Disorders of digestion, nerves, etc. Director, Dr. Perski. See also *Advt.*, p. lii

## PRINCIPAL BRITISH SPAS.

WITH INDICATIONS FOR THEIR THERAPEUTICAL EMPLOYMENT.

## THE BRITISH SPAS FEDERATION.

**Bath (Somerset).**—Sheltered from N. and N.E. winds by hills from 600 to 800 feet high; 107 miles from London. Average rainfall 31 inches. Climate mild and equable.

*Waters.*—The springs are hyperthermal (120°), radio-active, diuretic.

*Therapeutic Indications.*—Gout, arthritis, spondylitis, fibrositis, nervous debility, toxic neuritis, certain heart conditions, constipation and colitis, various skin diseases, chronic forms of rhinitis, pharyngitis and laryngitis, obesity, gravel, and hepatic dysfunction.

*Baths.*—A thoroughly equipped bathing establishment; including deep baths (500 gallons of natural hot radio-active water), undercurrent douching, douche massage in many forms, and intestinal lavage (Plombières douches), throat sprays and inhalation of the natural radium emanation, and the Bath thermal vapour treatment; also electrotherapy.

*Hotel.*—The Pulteney Hotel (see p. 97).

*Nursing and Baths.*—Lansdown Hospital and Nursing Home (see p. 78).

**Bridge of Allan (Stirlingshire).**—422 miles from London. Sheltered from N. and N.E. winds by the Ochil Hills. Average rainfall 36 inches. Climate mild and equable.

*Waters.*—Natural saline mineral springs.

*Therapeutic Indications.*—Rheumatism, gout, sciatica, many chest diseases, chronic affections of the liver, stomach, and bowels, and some diseases of the skin.

*Baths.*—Excellent suite of baths and electro-therapeutic apparatus.

**Buxton (Derbyshire).**—1000 to 1200 feet above sea level; 168 miles from London; 23 miles from Manchester. Sheltered from north and east winds. Very bracing air.

*Waters.*—Simple, highly radio-active, natural temperature 82° F., mainly bicarbonate of calcium and magnesium ingredients. Tasteless, odourless; also chalybeate springs.

*Therapeutic Indications.*—Gout, rheumatism, rheumatoid arthritis, sciatica, and various nervous diseases, neurasthenia, disorders of digestion, and skin diseases, malaria, mucocombranous colitis, arteriosclerosis, phlebitis, diseases of the throat [and air passages; anæmic conditions, and convalescence from prolonged illness.

*Baths.*—Establishments, including St. Ann's Well (Pump Room), recently modernized.

**Cheltenham (Gloucestershire).**—184 feet above sea level; 98 miles from London. Climate soft and mild. Average rainfall 27 inches. Sunshine 1486 hours.

**Waters.**—Four springs: the Fieldholme or twin saline, containing nearly equal parts of magnesium sulphate and sodium sulphate; the Lansdowne or sodium sulphate saline, the chief ingredients of which are sulphate and chloride of sodium; the Pittville or alkaline saline; and the Chadnor or magnesium and calcium saline.

**Therapeutic Indications.**—The toxic and congestive states associated with liver and stomach disorders, constipation, obesity, glycosuria, and gout.

**Baths.**—Including douche and massage.

**Droitwich Spa (Worcestershire).**—140 feet above sea level; 2½ hours by express train from London (Paddington), 19 miles from Birmingham, 7 from Worcester. Rainfall 25 inches. Mean maximum temperature 59° F., mean minimum temperature 43° F.

**Waters.**—The most powerful saline in the world. The brine is pumped from the triassic formation 200 feet below the ground level at a temperature of about 45° F., and is heated by introducing steam.

**Therapeutic Indications.**—Chronic muscular and articular rheumatism, arthritis, chronic articular or irregular gout, neuritis, sciatica, neuralgia, some heart disorders, sprains and injuries of tendons, muscles, joints, etc.

**Baths.**—Reclining, douche, needle, vapour, swimming, Aix-douche, Nauheim baths, brine-pine or Hornburg baths, etc.

**Hotel.**—Raven and Park Hotels (see p. 95); Worcestershire Brine Baths Hotel (see p. 100).

**Boarding Establishment.**—Ayrshire House (see p. 100).

**Harrogate (Yorkshire).**—350–600 feet above sea level, 203 miles from London. The climate is stimulating and fairly dry—bracing moorland air. Average rainfall 30 inches. Mean temperature 47° F.

**Waters.**—Celebrated for the medicinal properties of its different mineral waters—sulphurous, chalybeate, alkaline, and saline.

**Therapeutic Indications.**—Gout and other metabolic disorders, functional liver derangement and early cases of cirrhosis, cholelithiasis and cholecystitis, chronic skin diseases, neuritis and arthritis, mucous colitis, chronic dysentery, constipation, and intestinal toxæmia, anæmia, nervous diseases, hyperpiesia, and the sequelæ of tropical diseases.

**Baths.**—In the bathing establishments all the latest treatments are given.

**Mineral Water.**—‘Aquaperia’ aperient mineral water is bottled at Harrogate by Camwal Ltd. from their own Spring (see p. 163).

**Leamington Spa (Warwickshire).**—195 feet above sea level; 87 miles from London. Equable and mild climate. Average rainfall 25 inches. Mean annual temperature 49°. Westerly winds prevail.

**Waters.**—Hypertonic saline water; aperient and diuretic.

**Therapeutic Indications.**—Muscular and articular rheumatism, gout, rheumatoid arthritis, neuralgia, and neuritis, diseases arising from a plethoric condition of the chylipoietic viscera, conditions of increased vascular tension, and chronic interstitial nephritis.

**Baths.**—Turkish, massage douches, saline, Plombières, paraffin wax, Berthollet, electric, and swimming. (See also p. 94).

**Llandrindod Wells (Radnorshire).**—750 feet above sea level. Climate exceedingly bracing, but sheltered from east winds, and with an average rainfall of about 40 inches. About 170 miles distant from London.

**Waters.**—Saline, sulphur and radium-sulphur, magnesium, lithia saline, and chalybeate. Slightly aperient and strongly diuretic.

**Therapeutic Indications.**—Digestive disorders, gout and rheumatism, rheumatoid arthritis, neuritis and fibrositis, gall-stones and biliary stasis, renal calculus or any kidney or bladder condition requiring diuresis, and in neurasthenia.

**Baths.**—Sulphur, immersion, needle, and douche; Aix and Vichy douche and massage; Scotch douche; Nauheim; medicated baths; fango and peat baths; whirlpool and agitation baths; and most electrical treatments.

**Hotel.**—Ye Wells Hotel (see p. 96).

**Strathpeffer Spa (Ross-shire, N.B.).**—150 to 300 feet above sea level. Sheltered practically on all sides, except the N.E. Prevailing wind S.W. Bracing air. Average rainfall 31 inches. Mean annual temperature 45° F. About 584 miles from London.

**Waters.**—Sulphurous and chalybeate. Sulphates the predominating salt. Have strong diuretic and mild aperient action.

**Therapeutic Indications.**—Chronic gout and rheumatism, rheumatoid arthritis, chronic skin diseases, chronic disorders of the digestive system, chronic gastric or intestinal catarrh, sluggish portal circulation, congested liver, and neurasthenia.

**Baths.**—Sulphurous (immersion), inhalation, peat, douche (Aix and Vichy), needle, pine, Russian, Nauheim, Plombières, radiant heat (electric), and high-frequency current.

**Trefriw Wells (Carnarvonshire).**—5½ hours from London. The climate is bracing, the air soft, pure, and mostly of a westerly or south-westerly type. The pump-room and baths are open all the year, but the principal season is March to the end of October.

**Waters.**—Two varieties: (1) The stronger sulpho-chalybeate, and (2) the milder sulpho-chalybeate. Used internally, and externally in the form of baths.

**Therapeutic Indications.**—Curable forms of anemia, nervous, debilitating and wasting diseases, rheumatism, sciatica, gout, and neuritis.

### OTHER BRITISH SPAS.

**Church Stretton (Salop).**—613 feet above sea level. 153 miles from London. Pure bracing air, and a generally invigorating climate. Prevailing wind, S.W. Average rainfall 33 inches. Mean temperature 44°.

**Waters.**—Said to be the purest in Great Britain.

**Therapeutic Indications.**—Specially the 'open-air' cure of neurasthenia, for sequelæ of influenza, for insomnia, functional nervous diseases, chronic gout and rheumatism, chronic gastric and bronchial catarrh, debility from overwork, and convalescence after illness or operation.

**Ilkley (Yorkshire).**—Situated on the southern slope of the valley of the Wharfe, 211 miles from London, 18 miles from Harrogate. Occupying a sheltered position. Average rainfall 39 inches. Mean annual temperature 47° F. Bracing and invigorating moorland air.

**Waters.**—The water-supply obtained from springs is remarkably pure, bright, and sparkling. Chalybeate waters. Saline.

**Therapeutic Indications.**—Gout, rheumatism, neuritis, neurasthenia, anemia, asthma, and bronchitis cases are benefited. The treatment adopted is that known as hydro-therapeutic.

**Baths.**—Complete suites of baths are to be found in the numerous establishments. Electrical, Weir-Mitchell.

**Hydropathic Establishment.**—Craiglands Hydropathic (see p. 99).

**Llangammarch Wells (Breconshire).**—600 feet above sea level. 213 miles from London. Well protected from the east, and prevailing wind is S.W.

**Water.**—Saline, containing the chlorides of barium (6½ grains per gallon), calcium, magnesium, lithium, and sodium: the only one of its kind in the British Isles.

**Therapeutic Indications.**—Cardiac diseases, organic and inorganic, especially affections of the myocardium due to influenza. Graves' disease, chronic muscular and articular rheumatism, osteo-arthritis, gout, sciatica, and neurasthenia.

**Malvern (Worcestershire).**—500 feet above sea level. A health centre of long repute, 122 miles from London. Air dry and bracing. Prevailing winds S.W. and W. Average rainfall 30 inches. Mean temperature about 49° F. Exceptional sunshine records.

**Waters.**—Mainly spring, of remarkable purity, free from organic matter, less than 4 grains of earthy salts per gallon, with high eliminative qualities. The water is dispensed in a new Pump Room adjoining the Winter Gardens and Priory Park.

**Therapeutic Indications.**—Gout, rheumatism, rheumatoid arthritis, neuralgia, sciatica, lumbago, dyspepsia, constipation, anemia, bronchial, nephritic, and cutaneous diseases.

**Matlock (Derbyshire).**—143 miles from London. South-west aspect—well sheltered from the north and east. Climate free from extremes of heat and cold. The water pure and soft. Season all the year. The Matlock system of hydropathic treatment is carried out in all its branches. The principal Hydros are installed with latest electric baths and appliances.

**Therapeutic Indications.**—Gout, rheumatism, arthritis, neuritis, sciatica, lumbago, neurasthenia, colitis, cholecystitis, cardiac and renal diseases.

**Hydropathic Establishment.**—Smedley's Hydropathic (see p. 98).

**Physiotherapeutic Establishment.**—Rocksides (see p. 99).

At Matlock Bath there are thermal mineral springs of long-established repute, rising at 68° F.

**Peebles (Peeblesshire, N.B.).**—About 500–600 feet above sea level. One hour from Edinburgh and 382 miles from London. Average rainfall, about 38 inches. Bracing climate, but sheltered from the north winds.

**Waters.**—The chief ingredient is chloride of sodium. They are obtained from the famous St. Ronan's Well (6 miles east).

**Therapeutic Indications.**—The waters are specially suited to the Nauheim and Bourbon Lancy treatment of cardiac disease, dyspepsia, gout, rheumatism, and neurasthenia.

**Torquay (Devonshire).—**199½ miles from London. Non-stop express trains run daily, the journey occupying only 3½ hours. There are through carriages from Northern and Midland cities. The most beautifully situated marine health resort in the British Isles. Well sheltered from the north. The sunshine record is one of the highest in the country. Average rainfall, 34.2 inches. Mean temperature, 51.9°. Sunshine record averages 1742.9 hours.

*Climate.*—Mild, soft, and equable. It is specially beneficial for many pulmonary, bronchial, and laryngeal conditions, for mild cases of nephritis, for delicate children, and for aged and debilitated persons. Those unable to withstand the rigour of the winter in other British health resorts derive great benefit from residence in Torquay. The season is all the year round.

*Baths.*—The Marine Spa baths are very modern and complete. They are ideally situated. The recognized forms of spa treatment are available, and fully certificated assistants are retained upon the staff for electrical and other treatments. A medical consultation room is available for the convenience of medical practitioners and patients. There is a large warm sea-water swimming bath with modern filtration plant. Salt-water baths, concentrated brine baths, seaweed baths, and Dartmoor peat packs are a speciality, and are indicated in the treatment of muscular rheumatism, fibrositis, sciatica, rheumatoid arthritis, osteo-arthritis and gout. (*See also p. IIII.*)

**Tunbridge Wells (Kent).—**400 feet above sea level, 34 miles from London. Climate is tonic and invigorating. Prevailing winds W. and S.W. Average rainfall, about 32.3 inches. Mean temperature, 49°.

*Waters.*—A weak, non-aerated, chalybeate spring, containing 4 grains ferrous carbonate to the gallon, with sulphates and chlorides of potash, soda, and calcium.

*Therapeutic Indications.*—Waters indicated in anæmia, chlorosis, and allied conditions.

**Woodhall Spa (Lincolnshire).—**50 feet above sea level. 130 miles from London. Average rainfall 24 inches. Mean annual temperature 48°.

*Waters.*—Bromo-iodine waters, rich in the chlorides of sodium, calcium, and magnesium, with bromine and iodine.

*Therapeutic Indications.*—Rheumatism (chronic articular and muscular), lumbago, arthritis deformans, gouty arthritis, sciatica, neuritis, paralysis, neurasthenia; injuries to joints; skin diseases, psoriasis, urticaria; diseases peculiar to women; diseases of throat and nose; liver disorders.

*Spa Baths.*—These include immersion, shower, undercurrent, and local douches; Aix and Vichy douche massage; Nauheim, electric, and Schnee baths; Dowsing radiant heat and light baths.

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M	* 6 13 20 27
Tu	* 7 14 21 28
W	1 8 15 22 29
Th	2 9 16 23 30
F	3 10 17 24 31
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FEBRUARY	
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1936

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S	5 12 19 26 *

NOTES.

1936

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1936

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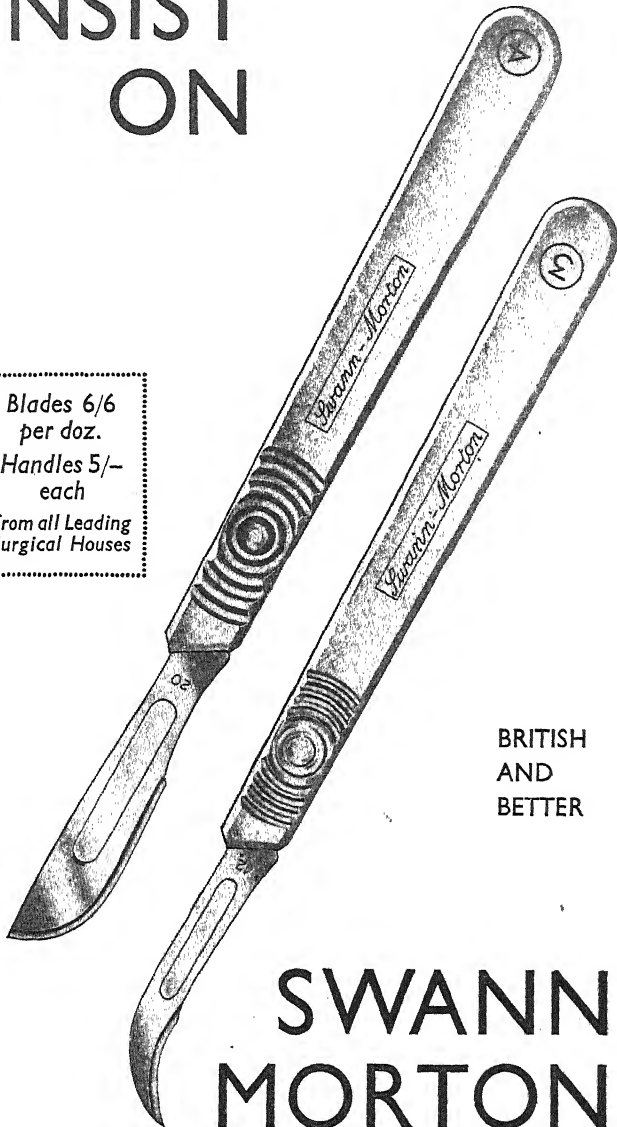
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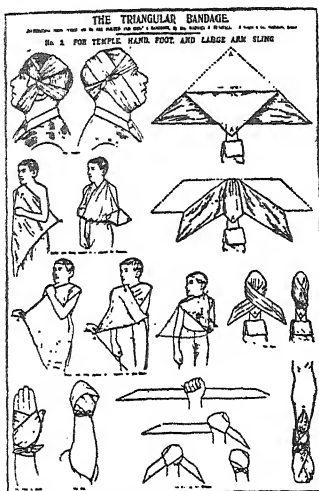
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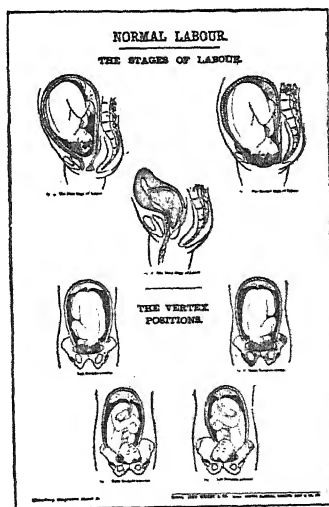
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## INDEX TO LIFE ASSURANCE OFFICES.

A. when Established; B. C. D. Annual Premiums to insure £1000 on death, with Profits, at the ages of 30, 40, and 50; E. Assurance and Annuity Funds, exclusive of Paid-up Capital; M. Mutual Office; P. Proprietary Offices.

Those marked with an asterisk (\*) in the E column have not returned our last form

† Not for the present issuing Policies under with Profit tables.

TITLE, ETC., OF OFFICE.	A	B	C	D	E
African Life Assurance Society, Ltd., River Plate House, Finsbury Circus, E.C.2. Sec., M. B. Massey-Hicks, F.I.S.A. . . . .	1904	24/10/2	33/12/10	43/5/5	6,817,461
Alliance Assurance Co. Ltd., Bartholomew Lane, E.C.2. Gen. Mans., A. Levine, R. F. Barnett P	1824	24/-/10	32/-/10	44/18/4	24,19*,576
Atlas Assurance Co. Ltd., 92, Cheapside, E.C.2. Gen. Man., C. H. Falloon. Act. and Life Man., William Penman . . . . .	1808	24/-/10	31/15/10	44/3/4	11,144,833
Australian Mutual Provident Society, 73-76, King William St., E.C.4. Man. for U.K., A. W. Nicholls, A.I.A. . . . .	1849	24/1/8	32/4/2	44/18/4	93,807,602
Beacon Insurance Co. Ltd., 142, Edmund St., Birmingham, 3. Chairman and Man. Dir., H. J. Greening. London Office, Insurance House, Kingsway, W.C.2 P	1883	23 6/8 Reduced	31/0/10 rates to	44/-/10 Abstain rs	3,734,712
Britannic Assurance Co. Ltd., Life, Fire, Accident, and General Insurances, Broad St. Corner, Birmingham. Chairman, Jno A. Jefferson, F.I.A. Sec., J. M. Laing, F.I.A., F.F.A. Further particulars see opposite page . . . . .	1866	23/10/10	31/18 4	43/18/4	25,000,000
British Equitable Assurance Co. Ltd., Royal Exchange, E.C.3. Man., Douglas A. Coleman . . . . .	1854	23/-/-	30/15/4	43/12/6	*1,093,120
British General Insurance Co. Ltd., 66, Cheapside, E.C.2. Man. Dir., Norman M. Walker . . . . .	1904	24/14 2	32/8/4	45/5/10	*1,033,749
†British Widows' Assurance Co. Ltd., 1, Old St., E.C.1. Joint Gen. Mans., Robert J. Jamieson and F. E. Crabtree . . . . .	1902	—	—	—	672,765
Caledonian Insurance Co., 19, George Street, Edinburgh. General Manager, F. J. Cameron, F.F.A., F.I.A., London (City) Office, 5, Lothbury, E.C.2. . . . .	1805	24/4/2	32/5/-	45/5/10	7,495,134
Canada Life Assurance Co., 2, St. James's Square, S.W.1. Man., J. R. Wandless, F.I.A. . . . .	1847	24/4/2	32/13/4	47/1/8	48,731,299
Clerical, Medical, and General Life Assurance Society, 15, St. James's Square, S.W.1, and 8, King William Street, E.C.4. Gen. Man. and Actuary, A. H. Rowell . . . . .	1824	24/5/10	33/-/-	47/15/4	*12,692,701
Colonial Mutual Life Assurance Society Ltd., 4, St. Paul's Churchyard, E.C.4. Man., Ernest A. Cawdron. Sec., J. S. Gillespie . . . . .	1873	24/7/6	32/10/10	44/18/4	*15,076,443
Commercial Union Assurance Co. Ltd., 24, Cornhill, E.C.3. Act., H. Brown, B.A., F.I.A. . . . .	1861	23/2/6	31/12/6	46/11/8	22,884,794
Confederation Life Association (of Canada), Bush House, Aldwych, W.C.2. Man., G. T. Varney. P	1871	24/3/8	32/1 8	45/1/8	20,369,400
Co-operative Insurance Society Ltd., 109, Corporation Street, Manchester. Man., J. P. Jones . . . . .	1867	22/8/4	30/15/0	44 2/6	7,151,017
Eagle Star & British Dominions Insurance Co. Ltd., 1, Threadneedle St., E.C.2.; Life Dept., 32, Moorgate, E.C.2. Man. Dir., Sir Edward M. Mountain, Bart., J.P. . . . .	1807	22/18/4	31/18/4	44/-/-	14,484,962
Equitable Life Assurance Society, 19, Coleman Street, E.C.2. Act. and Man., W. Palin Elderton M	1762	27/-/-	31/-/-	45/-/-	8,919,891
Equity & Law Life Assurance Society, 18, Lincoln's Inn Fields, W.C. Man. and Sec., A. C. Thorne, F.I.A. . . . .	1844	23/6/8	31/16/8	45 6/8	15,747,146

A, when Established; B, C, D, Annual Premiums to Insure £1000 on death, with Profits, at the ages of 30, 40, and 50; E, Assurance and Annuity Funds, exclusive of Paid-up Capital; M, Mutual Offices; P, Proprietary Offices.

Those marked with an asterisk (\*) in the E column have not returned our last form.

\* Not for the present issuing Policies under with Profit tables.

TITLE, ETC., OF OFFICE.	A	B	C	D	E
Friends' Provident & Century Life Office, 7, Leaden- hall Street, E.C.2, and 7, Charlotte Square, Edinburgh. Gen. Man., Henry J. Tapscott. Act. and Sec., Alfred Moorhouse, F.I.A. ... M	1892	22/10/2	32/1/8	45/8/4	9,139,639
General Life Assurance Company, General Buildings, Adwayn, W.C.2. Gen. Man., S. North-Miller ... P	1897	23/-/10	31/13/8	43/12/6	3,435,588
Gresham Life Assurance Society Ltd., 188-190, Fleet St., E.C.4. Man. and Sec., J. H. Stebbing ... P	1843	23/6/8	30/18/4	43/12/6	9,455,844
Guardian Assurance Co. Ltd., 64, King William St., and 21, Fleet Street, E.C. Gen. Man., A. G. Sweet, Act. and Sec., W. A. Osborne, F.I.A. ... P	1821	24/8/4	32/5/-	44/12/6	7,423,801
Law Union and Rock Insurance Co. Ltd., 7, Chancery Lane, W.C.2. Sec., A. H. Streatsury, F.I.A. ... P	1806	3/10/-	31/2/6	43/12/4	11,023,379
Legal & General Assurance Society Ltd., 10, Fleet St., E.C. Gen. Man., W. A. Workman, F.I.A. ... P	1836	—	—	—	27,920,452
Life Association of Scotland, 82, Princess St., Edin- burgh. Man. and Act., A. G. R. Brown. Sec., Francis J. McGreor, London, 28, Bishopsgate, E.C.2.	1838	24/9/2	32/8/4	45/10/10	7,522,835
Liverpool and London and Globe Insurance Co. Ltd., 1, Dale Street, Liverpool, 2. Gen. Man., F. J. Williams and J. Dyer Simpson. London Office, 1, Cornhill, E.C.3. ... P	1836	24/13/4	32/12/6	45/7/6	11,350,533
London & Scottish Assurance Corporation Ltd., King William Street House, Arthur Street, E.C.4. Man., Frank B. Cooke. Sec., A. G. H. Emslie. ... P	1862	23/7/6	31/7/6	44/11/8	4,236,323
London Assurance, The, 1, King William St., E.C. Act. and Life Man., A. G. Paton, F.I.A. ... P	1720	23/18/4	31/17/6	44/13/4	8,239,354
London Life Association Ltd., 81, King William St., E.C.4. Act. and Man., A. W. Evans, F.I.A. ... M	1806	22/-/-	29/12/-	42/-/-	26,244,304
Marine and General Mutual Life Assurance Society, 43, Fenchurch Street, E.C.3. Act. and Sec., Howard T. Cross, F.I.A. ... M	1852	23/14/2	31/18/4	45/5/-	3,676,316
Medical Sickness Annuity & Life Assurance Society, Ltd., 38, High Holborn, W.C. Man. and Sec., Bertram Sutton, F.C.I.I. Further par- ticulars see page xlv ... M	1884	21/9/2	23/16/8	40/15/10	3,216,332
Mutual Life and Citizens' Assurance Co. Ltd. (of Australia), Breitenham Ho., 1, Lancaster Place, W.C.2. Man., Alex. S. Sellar, M.A., F.F.A. ... P	1886	24/7/6	32/12/6	44/17/6	20,427,702
National Mutual Life Assurance Society, 39, King St., Cheapside, E.C.2. Act. and Man., G. H. Recknell, F.I.A., F.F.A. ... M	1830	21/3/4	31/15/10	44/15/0	5,981,170
National Mutual Life Association of Australasia, Ltd., A, Cheapside, E.C.2. Man., J. T. Campbell ... M	1869	23/6/8	31/15/0	43/11/8	40,900,000
National Provident Institution, 43, Gracechurch St., E.C.3. Act. and Sec., H. E. Melville, F.I.A. ... M	1835	24/8/4	33/2/6	46/18/4	11,565,722
North British & Mercantile Insurance Co. Ltd., 61, Threadneedle St., E.C.2 and 64, Princess St., Edin- burgh. Man. Dir., London, Sir A. Worley, Bt., C.B.E. Man., Edinburgh, J. E. Bell. ... P	1809	24/13/4	33/0/10	44/11/2	36,411,400
Northern Assurance Co. Ltd., 1, Moorgate, E.C.2. Gen. Man., K. K. Peters. ... P	1836	23/11/8	31/15/-	43/2/6	7,669,533
Norwich Union Life Insurance Society, Norwich. Gen. Man. and Act., H. G. Wilton, F.I.A. London, 49, Fleet St., E.C.4. Further particulars see page 14M	1808	24/3/4	32/15/10	47/2/6	39,176,446
Pear Assurance Co. Ltd., 252, High Holborn, W.C.1. Joint Man. Dir., H. H. Austin, F.I.A., and John Hopkins, F.C.I.S. ... P	1864	24/10/0	32/10/	46/-/-	7,663,358
Phoenix Assurance Co. Ltd., Phoenix House, King William St., E.C., 7, St. James's Street, S.W.1, and 187, Fleet Street, E.C.4. Man. Dir., R. Y. Sketch. Further particulars see page xlv ... P	1782	23/14/2	31/19/2	44/13/4	17,300,332

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Those marked with an asterisk (\*) in the *E* column have not returned our last form.

† Includes Guarantee Fund.

TITLE, ETC., OF OFFICE	A	B	C	D	E
Provident Mutual Life Assurance Association, 57 to 61, Moorgate, E.C.2. <i>Man. and Act.</i> , C. R. V. Coutts, F.I.A. .. .. M	1840	24/6/6	32/6/8	45/3/4	9,255,270
Prudential Assurance Co. Ltd., Holborn Bars, E.C.1. <i>Gen. Man.</i> , Sir Joseph Burn, K.B.E., F.I.A. .. P	1843	23/2/8	31/10/2	44/14/2	263,565,327
Refuge Assurance Co. Ltd., Oxford St. Manchester, 1. <i>Man. Dir.</i> , J. Procter Green, I.F. <i>Gen. Man.</i> , S. G. Leigh, F.I.A., London, 163, Strand, W.C.2. .. .. P	1854	23/5/4	31/4/11	43/15/8	56,912,354
Royal Exchange Assurance, Royal Exchange, E.C.3, and 44, Pall Mall, S.W.1. <i>Act.</i> , T. F. Anderson, F.I.A., F.F.A. .. .. P	1720	24/10/-	32/7/6	45/1/3	13,076,523
Royal Insurance Co. Ltd., 1, North John St. Liverpool, 2. <i>Gen. Man.</i> , F. J. Williams and J. D. Simpson, London Offices, 24-26, Lombard St., E.C.3. <i>Lead. Man.</i> , F. R. Bellamy .. .. P	1845	23/6/8	31/13/4	44/16/8	26,434,891
Royal London Mutual Insurance Society Ltd., Finsbury Sq., E.C.2. <i>Chairman and Man. Dir.</i> , Alfred Skeggs, F.C.I.I. <i>Sec.</i> , J. J. Pipe. <i>Act.</i> , J. H. Duffell, F.I.A. .. .. M	1861	23/6/8	31/17/6	45/15/10	31,762,784
Scottish Amicable Life Assurance Society, St. Vincent Place, Glasgow. <i>Man. and Act.</i> , R. Jeffrey, <i>Sec.</i> , J. M. Ross, London, 17, Tokenhouse Yard, E.C.2. <i>Sec.</i> , C. M. Aitken .. .. M	1826	25/-/10	32/17/6	45/5/-	11,646,579
Scottish Equitable Life Assurance Society, 23, St. Andrew Square, Edinburgh. <i>Man. and Act.</i> , A. C. Murray, <i>Sec.</i> , W. R. McIlvenna, London Office, 13, Cornhill, E.C.3. <i>Sec.</i> , W. S. King .. M	1831	24/10/-	32/6/8	45/3/4	10,542,980
Scottish Life Assurance Co. Ltd., 13, St. Andrew Sq., Edinburgh, 2. <i>Gen. Man.</i> , S. F. M. Cumming, F.F.A., London Office, 9, King St., E.C.2. <i>Man.</i> , Jas. A. Hay .. .. P	1881	23/14/2	31/5/-	44/4/2	7,664,526
Scottish Provident Institution, 6, St. Andrew Square, Edinburgh. <i>Man.</i> , Sir Robert T. Boothby, K.B.E. <i>Joint Sec.</i> , A. Graham Donald and C. S. Willis, <i>Act.</i> , J. R. Armstrong, London Offices, 3, Lombard St., E.C.3, 36, Leadenhall St., E.C.3, 36, Chancery Lane, W.C.2, and 17, Pall Mall, S.W.1. .. .. M	1837	17/11/8	25/3/4	37/17/6	23,889,140
Scottish Temperance & General Assurance Co. Ltd., 103, St. Vincent St., Glasgow. <i>Man.</i> , Wm. Bannatyne, F.F.A., London, 2, 3 & 4, Cheapside. <i>Man.</i> , C. S. McDonald. (Less 10 per cent to Abstainers) M	1883	24/5/-	31/17/6	44/13/4	7,490,084
Scottish Union & National Insurance Co., 35, St. Andrew Square, Edinburgh, 2. <i>Gen. Man.</i> , James G. Nicoll, London Office, 5, Walbrook, E.C.4. <i>Sec.</i> , H. F. Kirrage .. .. P	1824	25/-/-	32/13/8	46/-/-	11,490,932
Scottish Widows' Fund & Life Assurance Society, 9, St. Andrew Square, Edinburgh. <i>Man. and Act.</i> , H. G. Sharp, F.F.A., F.I.A., <i>Dep. Man. and Sec.</i> , E. V. Townshend, London Offices, 23, Cornhill, E.C.3, 17, Waterloo Place, S.W.1., and 107, Fleet Street, E.C.4. <i>Further particulars see page iv</i> M	1815	24/13/4	32/10/10	45/10/-	31,500,511
Southern Life Association, Bush House, Aldwych, W.C.2. <i>Man.</i> , Thos. Darling .. .. M	1891	23/6/8	31/-/-	44/3/4	6,264,122
†Standard Life Assurance Co., 3, George Street, Edinburgh. <i>Man.</i> , S. E. Macnaghten, F.F.A., F.I.A., A.C.A., London Offices, 46, Queen Victoria St., E.C.3, <i>Sec.</i> , A. B. Drayton, and 15a, Pall Mall, S.W.1, <i>Sec.</i> , E. V. Goodall .. .. M	1825	24/7/6	32/3/4	45/-/10	24,764,100
Sun Life Assurance Co. of Canada, 2, 3, & 4, Cockspur Street, S.W.1. <i>General Manager</i> , H. O. Leach. .. P	1865	24/4/-	32/13/-	47/1/-	123,157,062

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TITLE, ETC., OF OFFICE.	A	B	C	D	E
<p>Sun Life Assurance Society, 63, Threadneedle Street, E.C.2. Gen. Man., Sec., and Act., J. Rietchel, F.I.A. Joint Sec., G. M. Searle, F.I.A. Joint Act., H. H. Edwards, F.I.A. . . . . P</p> <p>United Kingdom Provident Institution, 196, Strand, W.C.2. Sec. and Act., W. G. Barrett . . . M</p> <p>University Life Assurance Society, 25, Pall Mall, S.W.1. Act. and Sec., J. I. Gopp, F.I.A. . . P</p> <p>Wesleyan &amp; General Assurance Society, Life, House Purchase, Annuities, Fire and General Business, Assurance Buildings, Steelhouse Lane, Birmingham, 4. Man. Director, A. L. Hunt. Further particulars see page 17 . . . . . M</p> <p>Yorkshire Insurance Company Ltd., Chief Offices: St. Helen's Square, York. Yorkshire House, 66-67, Cornhill, E.C.3. London Branches, 22 Mincing Lane, E.C.3. 48, Pall Mall, S.W.1; 49, Sloane Square, S.W.1; 496, Brixton Road, S.W.9; 6, Norfolk St., Strand, W.C.2; 43, Broadway, Stratford, E.15; 551, High Rd., Tottenham, N.17; 280, Euston Rd., N.W.1. Further particulars see opposite page . . . P</p>	<p>1810</p> <p>1840</p> <p>1825</p> <p>1841</p> <p>1824</p>	<p>24/11/8</p> <p>23/10/-</p> <p>26/-/-</p> <p>23/13/8</p> <p>23/9/2</p>	<p>33/5/-</p> <p>31/-/-</p> <p>34/-/-</p> <p>32/3/4</p> <p>31/11/8</p>	<p>47/1/8</p> <p>43/11/8</p> <p>47/-/-</p> <p>45/2/8</p> <p>45/8/4</p>	<p>34,951,799</p> <p>21,681,722</p> <p>1,501,014</p> <p>12,033,772</p> <p>3,957,102</p>

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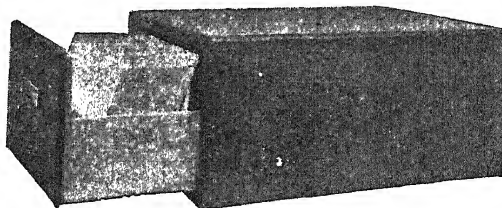
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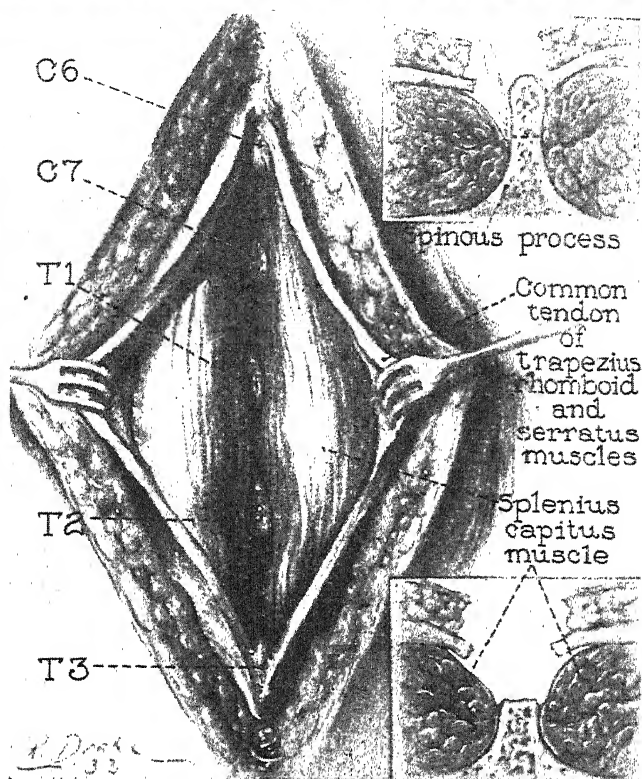
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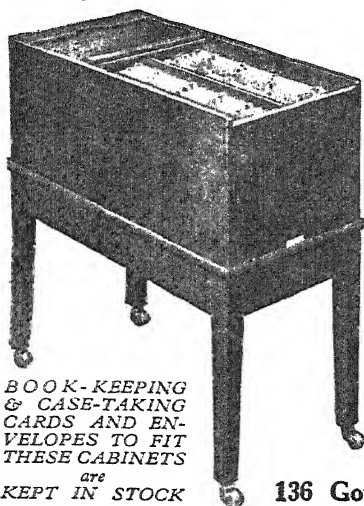
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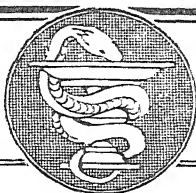
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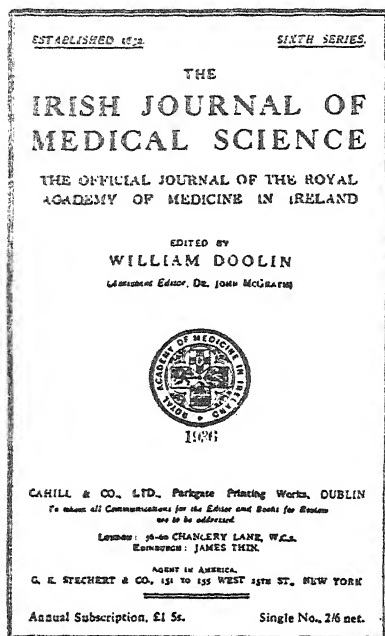
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A. C. ROXBURGH, M.D., F.R.C.P.	..	St. Bartholomew's Hospital
H. C. G. SEMON, M.D., M.R.C.P.	..	Royal Northern Hospital
W. KNOWSLEY SIBLEY, M.D., M.R.C.P.	..	St. John's Hospital
M. SYDNEY THOMSON, M.D., M.R.C.P.	..	King's College Hospital
J. E. M. WIGLEY, M.B. M.R.C.P.	..	Charing Cross & St. John's Hospitals

Lectures and Demonstrations are given regularly during the Winter and Summer Sessions. Instruction is given daily in the Out-Patient Department as above. Special classes or individual teaching can be arranged in the Pathological Department. For fees and further particulars apply to the Dean or Secretary.

LEONARD G. R. TURPIN, F.C.C.S. *Secretary*

J. E. M. WIGLEY, M.B., *Dean*.

# ST. MARY'S HOSPITAL MEDICAL SCHOOL

(University of London)

TERMS BEGIN in JANUARY, APRIL, and OCTOBER.

## **EXCEPTIONAL SITUATION.**

The situation of the Hospital and Medical School is unique, for while it is adjacent to a large poor district with a population of 500,000, it is also within a few minutes' walk of Kensington Gardens and an extensive residential district, in which students can live, and so avoid a daily wearisome journey to and from their work. Recent structural alterations include two new operating theatres and 75 additional beds.

## **RE-BUILDING OF THE MEDICAL SCHOOL.**

Approximately £250,000 has been spent in re-building the Medical School and Laboratories. The New Buildings are now in use. Apart from the Laboratories, Class-rooms, and Theatres for all the subjects in the Curriculum, they include a Library, Restaurant, Students' Club, Billiard room, full sized Swimming Bath, Squash Rackets Court, Gymnasium, Boxing ring, and an underground Garage for fifty Cars.

## **SPECIAL CLINICAL FACILITIES.**

The formation of Clinical Units in Medicine and Surgery has been an important advance in connection with the Clinical teaching, and this has been further developed by the affiliation for teaching purposes of several of the Hospitals in the neighbourhood, bringing up the total number of beds, available for teaching, to 1000. By agreement with Queen Charlotte's Lying-in Hospital, all students of St. Mary's attend a short course of instruction there, without extra fee, before entering upon their duties in the Maternity District of St. Mary's.

## **INSTITUTE OF PATHOLOGY AND RESEARCH.**

The Institute of Pathology and Research, under the directorship of Sir Almroth Wright, F.R.S., embraces seven departments, the heads of which are members of the Honorary Staff of the Hospital.

## **RESEARCH STUDENTSHIPS.**

A considerable sum is devoted annually to research, and a part of this is applied to the upkeep of Research Scholarships, designed to enable students recently qualified to learn the technique of research work.

## **ENTRANCE SCHOLARSHIPS.**

All Entrance Scholarships are awarded annually by nomination.

The Geraldine Harnsworth Scholarship (£200), and other University Scholarships, are open to members of British Universities who have completed their examination in Anatomy and Physiology.

## **APPOINTMENTS AFTER QUALIFICATION.**

Numerous appointments are open to newly qualified members of the Medical School. Six House Physicians (eight months), Ten House Surgeons (six to eight months), and Four Resident Obstetric Officers (six months) are appointed annually. Two Resident Anaesthetists (six months), £150 per annum, Four Casualty House Surgeons (six months), £100 per annum, with board and residence. Two Medical Registrars and Surgical Registrar, £200 per annum, with partial board. Obstetric Registrar and Radium Registrar, each £50 per annum, with partial board.

In addition to the above, Five Assistants to the Medical and Surgical Units are appointed from time to time, with salaries ranging from £400 to £750 per annum.

## **ATHLETIC GROUND.**

The Athletic Ground is situated at North Wembley, and can be reached in 20 minutes from the Medical School.

*The Illustrated Prospectus can be obtained from the School Secretary, St. Mary's Hospital, Paddington, W.2.*

C. M. WILSON (M.C.), M.D., F.R.C.P., Dean.

FOUNDED

1866

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Free and Paying Patients received in both In- and Out-Patient Departments. The latter is open every week-day except Saturday, at 2 p.m.

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AND

**PARALYSIS**

and other diseases of the Nervous System

**MAIDA VALE****LONDON**

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Ear, Nose &amp; Throat

Dental

Ophthalmic

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Psychiatric

20 Private Wards

6 Pay Beds

**H. W. BURLEIGH***Secretary***GORDON HOSPITAL FOR RECTAL DISEASES**

VAUXHALL BRIDGE ROAD, LONDON, S.W.1.

FOUNDED 1884. President: JOHN ARTHUR DEWAR, Esq.

35 BEDS.

Chairman—M<sup>r</sup>. REGINALD CORFIELD.

Bankers—Messrs. Hoare &amp; Co., 37, Fleet Street.

**HONORARY MEDICAL STAFF.***Consulting Surgeons.*—P. Maynard Heath, Esq., M.S., F.R.C.S.; C. J. Ogle, Esq.*Surgeons.*—W. Ernest Miles, Esq., F.R.C.S.; Peter L. Daniel, Esq., F.R.C.S.; A. Lawrence Abel, Esq., M.S., F.R.C.S.; Eric Crook, Esq., M.Ch., F.R.C.S.; Michael Smyth, Esq., M.Ch., F.R.C.S.; Ronald W. Haven, Esq., F.R.C.S.*Anesthetists.*—Donald Jarman, Esq., M.R.C.S., L.R.C.P.; Maurice Hudson, Esq., M.B., B.S.; E. F. Johnson, Esq., M.B., B.S.; L. H. Morris, Esq., M.R.C.S., L.R.C.P.*Resident Medical Staff.*—One House Surgeon.*Matron.*—Miss M. L. Burnett.

Operations Monday to Friday. The practice of the Hospital is free to Medical Men and Students. Out-patients seen on Mondays, Tuesdays, Wednesdays, Thursdays, and Fridays at 2 p.m. Tuesdays at 6 p.m. All treatment is free. In-patients pay according to their means for maintenance.

**PRIVATE WARDS.**

A chief feature of the Hospital is to provide for sufferers whose means are unequal to the cost of private treatment, and who yet are not fit subjects for a Free Hospital.

**KING'S COLLEGE HOSPITAL**

DENMARK HILL, LONDON, S.E.5

School of Instruction in RADIOGRAPHY, RADIOTHERAPY and CLINICAL PHOTOGRAPHY for the Training of Technical Assistants in X-RAY and RADIUM DEPARTMENTS.

The School is under the supervision of HUGH DAVIES, M.A., M.R.C.S., D.M.R.E., Director of the Radiographic Department, who is assisted by a Staff of Qualified Teachers.

For particulars apply to the Principal: Miss E. L. FRANKLIN, M.R.C.S., L.R.C.P., D.M.R.E.

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COUNTY OF LONDON.

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# THE MAUDSLEY HOSPITAL

## DENMARK HILL, S.E.5.

*Medical Supt.* - EDWARD MAPOTHER, M.D., F.R.C.P., F.R.C.S.

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THIS HOSPITAL, organized by the London County Council on the lines of the combined Neurological and Psychiatric Clinics of the Continent and America, represents the first provision of its kind by a public body in this country. Its objects are:—

- (a) Research into the pathology and treatment of Nervous and Mental Disorders;
- (b) Instruction of Medical Students, and advanced post-graduate courses in Psychological Medicine;
- (c) Facilities for diagnosis of difficult cases;
- (d) **TREATMENT** of all forms of Nervous Disorders (both organic and functional), including early and recoverable forms of mental disturbance.

Admission as in-patients for psychoses is limited to cases of good prognosis, or of particular value for research or teaching, except in very special cases for diagnosis.

Approval by the Medical Superintendent is an indispensable preliminary.

Treatment is entirely on a voluntary basis. Every in-patient is required to sign an application form for admission, and is entitled to leave within 24 hours of notifying desire to do so. Restriction of liberty while in Hospital is reduced to a minimum.

The special features of treatment at this Hospital for mental disturbances include (1) Complete absence of association with the certified insane; (2) Careful separation, from admission, of the quiet from restless cases; (3) A Medical Staff sufficiently numerous for modern individual psycho-therapy; (4) All means of physical treatment; (5) The services of eminent specialists in various branches of medicine and surgery; (6) The co-operation of a Pathological Department under Dr. F. L. GOLLA, ensuring application of the most modern methods; (7) A very numerous, highly educated, and experienced nursing staff, almost entirely women.

**OUT-PATIENTS** are seen at 2 p.m. (Men on Mondays and Thursdays, Women on Tuesdays and Fridays). The Children's Clinic is held on Mondays and Fridays at 10 a.m. All types of nervous and mental disorder are eligible for treatment in this Department.

**IN-PATIENTS:** Accommodation includes—

- (a) 200 Beds in wards and separate rooms of the Maudsley Hospital itself.
- (b) 35 Beds in wards and separate rooms in an Annexe at King's College Hospital.
- (c) A Ward (including some Private rooms) reserved for selected Patients of each sex in the Maudsley Hospital.

**TERMS:**

£5 a week, but in case of patients with a legal settlement in the County of London a less sum may be charged according to means.

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All communications should be addressed to the *Medical Superintendent*.

# ROYAL NORTHERN GROUP OF HOSPITALS

8,320 In-Patients, and 380,703 Out-Patient Attendances Annually.

Royal Northern Hospital, Holloway, N.7 - - - 300 Beds

Recognised by the Examining Board of the Royal College of Physicians and Surgeons as a place of study during the Fifth Year of the Medical Curriculum. Thirty Special Departments are maintained. Re-equipped Light and X-ray Departments, Maternity Department, Conventillery, Waris, General Waris, St. David's Wing with 80 beds for private patients in private rooms, with separate Operating Theatres for the Wing, private Sitting Rooms and sun Rooms.

Royal Chest Hospital, City Road, E.C.1. - - - 85 Beds

For treatment of all Diseases of the Heart and Chest. Cases of Tuberculosis are admitted for diagnosis only.

Grovelands Hospital (Recovery), Southgate, N.14. - - - 60 Beds

For reception of patients from above Hospitals.

Reckitt Convalescent Home, Clacton-on-Sea - - - 35 Beds

Maternity Nursing Association, Myddelton Square, E.C.1,

235 Camden Rd., N.7, & Howard Rd., Sth. Tottenham, N.15 466 Beds  
For District Midwifery work with Ante-Natal and Infant Welfare Clinics.

## FUNDS ARE URGENTLY NEEDED.

### Post Graduate Instruction

Special Courses are held in Medical and Surgical and special subjects, and are open to all medical practitioners free of charge. The Lectures are advertised beforehand in the Medical Journals.

### Special Courses in Anæsthetics

3 Months—3 Guineas; 6 Months—4 Guineas.

Clinical Assistantships are available in all departments of the Hospital. Clinical Clerkships and Pathological Clerkships for a period of 3 months are available. Fees—2 Guineas.

### School for Radiographers

Courses lasting 12 to 15 months commence in April and October for the training of Radiographers.

Further particulars may be obtained from:

Fees—25-30 Guineas.

Gilbert G. Panter, Secretary, Royal Northern Hospital, Holloway, N.7.

# The Royal Dental Hospital of London

## SCHOOL of DENTAL SURGERY *(University of London)*

LEICESTER SQUARE, LONDON, W.C.2.

Students are admitted for the curriculum for the B.D.S. Degree, and the L.D.S. Diploma in October, January and May.

**HOSPITAL PRACTICE.** The School is furnished with modern equipment, and the Clinic of the Hospital is unrivalled. Students may attend the operations in the In-Patient Department, and chair-side instruction is given in Advanced Operative Technique and Orthodontics.

**DENTAL PROSTHETICS.** The Mechanical Laboratory is a spacious and fully equipped department, under the direction of the Lecturer in Prosthetics.

**HOUSE APPOINTMENTS.** Six Senior House Surgeons and eighteen ordinary House Surgeons are appointed every year.

**POST-GRADUATE INSTRUCTION.** Instruction can be arranged in all branches of Dental Surgery.

Write for further particulars and School Calendar to THE DEAN.

# LONDON FEVER HOSPITAL

FOUNDED 1802.

ISLINGTON, N.1.

The only Hospital of its kind in or around London which is NOT RATE SUPPORTED.

DISEASES TREATED are SCARLET FEVER, DIPHTHERIA, MEASLES and GERMAN MEASLES in the GENERAL WARDS, these and other INFECTIOUS DISEASES in PRIVATE ROOMS.

Governors are entitled to FREE Treatment in the Wards for themselves and Members of their households, and Contributing Firms for their Employees.

General Ward Fees—Children, 2 guineas; Adults, 3 guineas per week.

Private Rooms—7 and 10 guineas per week.

AMBULANCE sent on receipt of Telephone message (CLERKENWELL 9786).

Secretary - W. ELLIOT DIXON.



# Central London Throat, Nose, and Ear Hospital

GRAY'S INN ROAD, LONDON, W.C.1

(Close to King's Cross Stations).

**OUT-PATIENT CLINICS** are held daily, during which special attention is given to the instruction of Post-Graduate Students.

**CLINICAL ASSISTANTSHIPS** are tenable for periods of three, six or twelve months, and Clinical Assistants are expected to attend at least two clinics a week, when a table is reserved for them in the Out-Patient Department for the examination of patients. These appointments afford the best method of obtaining a satisfactory knowledge of the Speciality.

Arrangements can always be made to suit the individual requirements of those in general practice who may be unable to attend regularly.

**WEEKLY LECTURES** by members of Hon. Medical Staff—Fridays 4 p.m.

**COURSES IN METHODS OF EXAMINATION AND DIAGNOSIS** are given at frequent intervals.

**COURSES IN ANATOMY AND PHYSIOLOGY** for **PART I** of the **D.L.O. EXAMINATION**; and **CLINICAL COURSES** for **PART II** OF THE EXAMINATION (with Peroral Endoscopy, and Pathology and Bacteriology Classes) are given twice yearly in May and October.

A full syllabus of the routine work and of the D.L.O. Courses may be obtained from the **DEAN**, or the **SECRETARY-SUPERINTENDENT**.

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## University of St. Andrews

(SCOTLAND).

*Chancellor*—The Rt. Hon. STANLEY BALDWIN, M.P., P.C., LL.D.

*Rector*—The Most Hon. the MARCHESE MARCONI.

*Vice-Chancellor and Principal*—Sir JAMES COLQUHOUN IRVINE, C.B.E., D.Sc., LL.D., Sc.D., D.C.L., F.R.S.

### FACULTY OF MEDICINE

(Dean—F. J. CHARTERIS, M.D.)

The University confers the following **DEGREES AND DIPLOMAS**—M.B., Ch.B., M.D., Ch.M., Ph.D., D.P.H., L.D.S., D.P.D. (all open to men or women).

**SESSION 1935-1936** opened 2nd October, 1935. The whole curriculum may be taken at Dundee, or the first two years may be taken in St. Andrews, the remaining three in Dundee.

**CLINICAL INSTRUCTION** at Dundee Royal Infirmary, and other Medical and Surgical Institutions in Dundee.

**BURSARY** (Scholarship) Competitions. June annually. Entries due 4th May.

**RESIDENTIAL ENTRANCE SCHOLARSHIPS** FOR MEN. Five or six of £100 competed for in June. Medical Students are eligible.

**FEES** for complete M.B., Ch.B. Course, exclusive of Examination Fees, Hospital Fees, etc., £182. Fees for L.D.S., £88 10s.; Fee for D.P.D., £25.

**PRELIMINARY EXAMINATION.** September and March. Entries due 4th August and 6th February.

**RESIDENCE HALLS** for Men and Women at St. Andrews; for Women at Dundee.

Provision made for **POST-GRADUATE STUDY AND RESEARCH**.

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Full information may be obtained from the **SECRETARY OF THE UNIVERSITY**, 71 North Street, St. Andrews; or, the **DEAN OF THE FACULTY OF MEDICINE**, Westlands, St. Andrews.

# UNIVERSITY of BRISTOL

## — ( FACULTY OF MEDICINE ) —

THE University affords complete courses of instruction for the examinations for its own Medical and Dental Degrees and Diplomas, and, when vacancies permit, for the examinations of other bodies.

The University confers the following Degrees and Diplomas :

BACHELOR OF MEDICINE AND BACHELOR OF SURGERY	M.B., Ch.B.
MASTER OF SURGERY .. .. .	Ch.M.
DOCTOR OF MEDICINE .. .. .	M.D.
DOCTOR OF PHILOSOPHY .. .. .	Ph.D.
BACHELOR OF DENTAL SURGERY .. .. .	B.D.S.
MASTER OF DENTAL SURGERY .. .. .	M.D.S.
DIPLOMA IN DENTAL SURGERY .. .. .	L.D.S.

The early part of the curriculum so interlocks with the curriculum for the B.Sc. degree that the taking of this degree in addition to the M.B., Ch.B. is facilitated. The whole of the Dental Mechanical work for the Bristol Royal Infirmary and the Bristol General Hospital is done in the University laboratory by the students, instructed by the Lecturer in Dental Mechanics and a staff of skilled mechanics.

**CLINICAL WORK** is done at the Bristol Royal Infirmary and the Bristol General Hospital, which together contain 673 beds. The Bristol Royal Hospital for Sick Children and Women (120 beds), the Bristol Eye Hospital, the Bristol City and County Asylum, the Bristol City Fever Hospital and, by the kind permission of the Health Committee of the Bristol City Council, Southmead Hospital are also open for the clinical instruction of students.

**SCHOLARSHIPS.**—There are Henry Herbert Wills Science Scholarships, a Miriam Badock Entrance Scholarship, available to boys from Clifton College, a Harold Greenwood Scholarship, tenable by a candidate who has received instruction at a State-provided school in Clevedon (or elsewhere in Somerset) and subsequently at a Secondary school in Somerset (or Bristol), and a Skillicorne Memorial Scholarship available to a pupil in Cheltenham Grammar School, which may be held in the Faculty of Medicine. Students from the City of Bristol may, on their merits, receive financial aid from the City Scholarship Fund on application to the Director of Education, Guildhall, Bristol. Forms of application must be returned to him by April 30th.

Several Scholarships and Prizes are open to students during their Hospital career.

**HOSPITAL APPOINTMENTS** open to students after qualification :—

At the Bristol Royal Infirmary.—Four House Surgeons, one Casualty House Surgeon, two House Physicians, one House Physician for Cancer Research Wards, one Resident Obstetric Officer, one Ophthalmic and Gynaecological House Surgeon; one Ear, Nose and Throat House Surgeon; one Assistant to the Senior Resident Medical Officer, who also acts as House Surgeon, and House Surgeon to the Skin Department; and one Dental House Surgeon.

At the Bristol General Hospital.—Senior Resident Medical Officer; one Casualty House Surgeon; two House Physicians; two House Surgeons; one Resident Obstetric Officer; one House Surgeon for Special Departments; one Dental House Surgeon. All these appointments are salaried, with board and residence.

For further particulars and prospectus apply to the DEAN of the Faculty of Medicine.

# **QUEEN CHARLOTTE'S MATERNITY HOSPITAL AND MIDWIFERY TRAINING SCHOOL** MARYLEBONE ROAD, N.W.1

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**Consulting Physician: H. MORLEY FLETCHER, M.D., F.R.C.P.**  
**Consulting Surgeon—Sir T. CRISP ENGLISH, K.C.M.G., M.B., D.S., F.R.C.S.**

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C. McMORAN WILSON, M.C., M.D., F.R.C.P.

**Assistant Physician.**  
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**Pædiatrician.**  
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**Surgeon.**  
C. H. S. FRANKAT, C.B.E., D.S.O., M.B., F.R.C.S.

**Ophthalmic Surgeon.**  
F. A. JULER, M.B., F.R.C.S.

**Ear, Nose and Throat Surgeon.**  
J. P. MONKHOUSE, M.B., B.S., F.R.C.S.

**Dental Surgeon.**  
J. D. CAMERBROOK, M.B.S., L.R.C.P.

**Medical Officers Ante-Natal Dept.**  
GERTRUDE DEARLEY, M.D., F.R.C.O.G.  
A. MORRIS JOHNS, M.D., CH.B.  
J. D. KLEW, M.D., M.C.O.G.

**Medical Officer, Infant Consultation Centre.**  
A. A. MONCRIEFF, M.D., F.R.C.P.

**Hon. Director of Research Laboratories and Consulting Bacteriologist.**  
LEONARD COLEBROOK, M.B., B.S.

Qualified Practitioners and Students are admitted to the Practice of this Hospital. There are 130 Beds, and about 2,700 Patients are received annually. In addition to the valuable routine work of the Hospital and Ante-Natal and Child Welfare Departments, unusual opportunities are afforded of seeing Obstetrical Complications and Operative Midwifery, more than one-half of the total admissions being primiparous cases. There are 30 beds at the Isolation Block and Research Laboratories at Hammersmith for cases of puerperal fever and puerperal pyrexia. Clinical Demonstrations are given by the Staff daily. The Residential College for students is opposite the Hospital (with which it is in telephonic communication).

For Rules, Fees, &c., apply to H. B. STOKES, Secretary-Supt.

# **KING'S COLLEGE HOSPITAL MEDICAL SCHOOL**

(UNIVERSITY OF LONDON)

DENMARK HILL, LONDON, S.E. 5.

THE NEW BUILDINGS of the Medical School were opened in July, 1933.  
THE HALL OF RESIDENCE is near to the School.  
THE ATHLETIC GROUND is within 10 minutes' walk of the Hospital.  
FOURTEEN ENTRANCE SCHOLARSHIPS, total value of £1,530, are awarded annually.  
DENTAL SCHOOL. A full Dental Course is given at King's Coll. Hospital and King's College.

The Calendar, Details of Scholarships, etc., will be sent on application to the DEAN, J. A. DRAKE, M.D., F.R.C.P., D.P.H.; or to the Secretary, S. C. RANNER, M.A., King's College Hospital Medical School, Denmark Hill, London, S.E. 5.

# **QUEEN MARY'S HOSPITAL FOR THE EAST END**

(Founded 1861; Incorporated by Royal Charter, 1917).

**STRATFORD, LONDON, E.15**

Patron: HER MAJESTY THE QUEEN.

President: HIS ROYAL HIGHNESS THE DUKE OF GLOUCESTER, K.G.

Deputy President: Sir LEONARD LYLE, Bt., J.P. Chairman: T. MAY-SMITH, Esq., J.P.

Secretary: MAJOR RAPHAEL JACKSON.

THE POOREST OF THE POOR are treated at this Hospital. Normal Accommodation. 219 Beds. Cost of Entowing a Bed, £1000; a Cot, £500. Funds most urgently needed to meet current expenditure, and will be gratefully received by CLAUD F. GODDARD, Esq., Hon. Treasurer, 22 King Street, S.W.1, or by the Secretary.

In-Patients treated, 1934	..	3,553	Out-Patient Attendances, 1934	..	145,705
Accidents treated, 1934	..	16,696	Ordinary Expenditure, 1934	..	£46,589
Income from Annual Subscriptions and Invested Property			..	£4921	

RAPHAEL JACKSON (Major), Secretary.

1825

1936

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 { R. J. McNEILL LOVE, Esq., F.R.C.S. (Eng.).  
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 R. CHRISTIE BROWN, Esq., M.S. (Durh.), F.R.C.S., M.C.O.G.  
*Assistant Obstetric Surgeons:*  
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 J. V. O'SULLIVAN, Esq., M.D., M.R.C.P. (Lond.), F.R.C.S. (Eng.), M.C.O.G.  
 J. B. BLAICKLEY, Esq., M.B., B.S. (Lond.), F.R.C.S. (Eng.).  
*Clinical Assistant to Child Welfare Centre:* J. D. LEGGE CURRIE, Esq., M.R.C.S., L.R.C.P.  
*Resident Medical Officers:* (TWO).

*Physician to the Hospital:*  
 SYDNEY A. OWEN, Esq., M.D., F.R.C.P.  
*Pathologist:*  
 H. C. LUCEY, Esq., M.D., B.S. (Lond.), D.P.H.  
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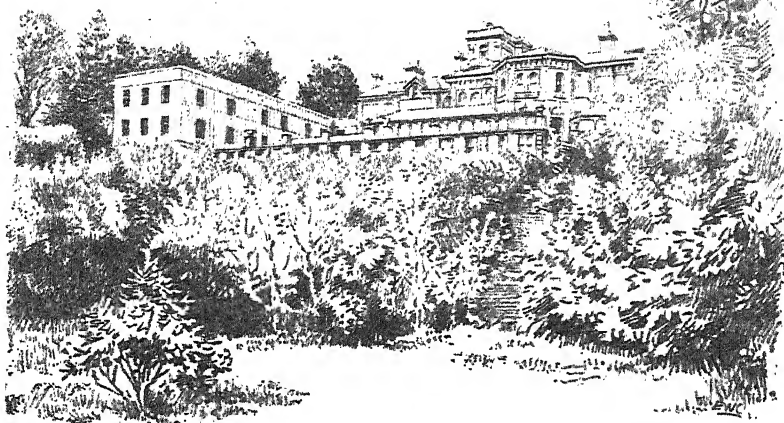
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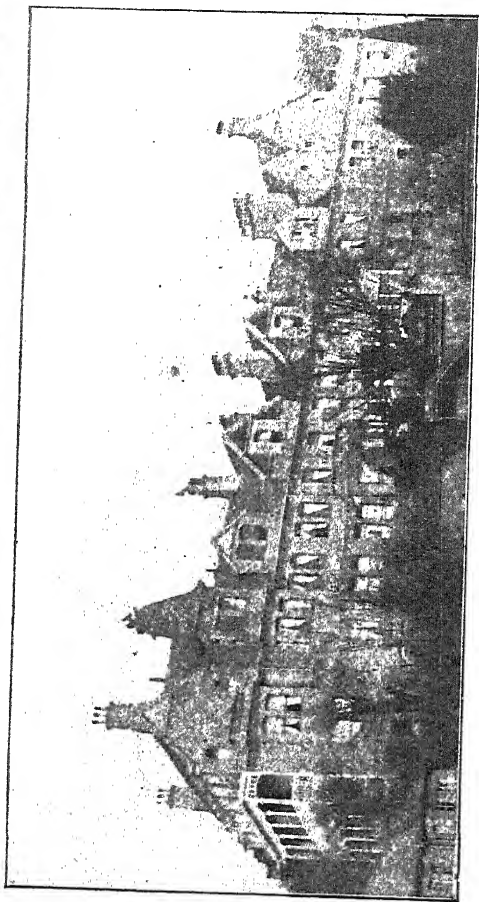
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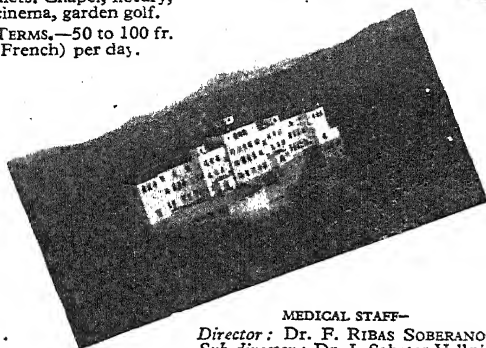
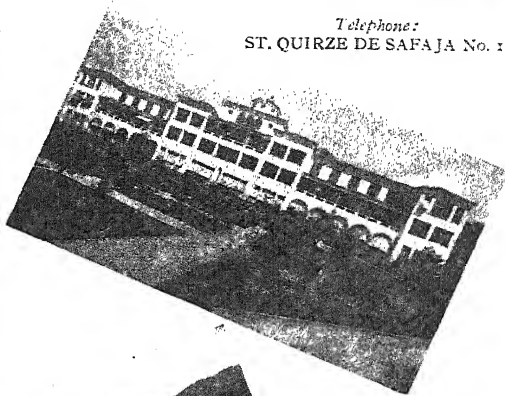
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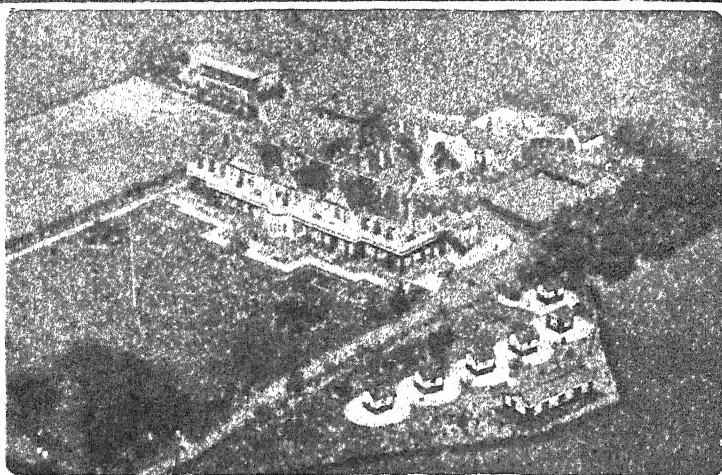
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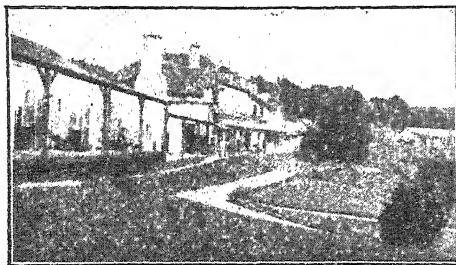
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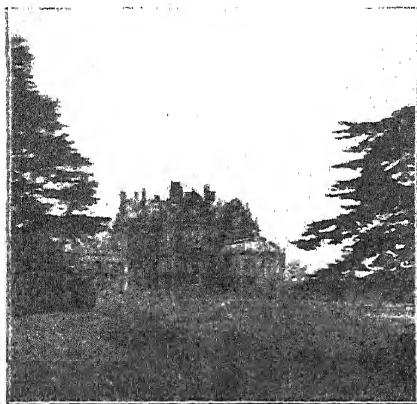
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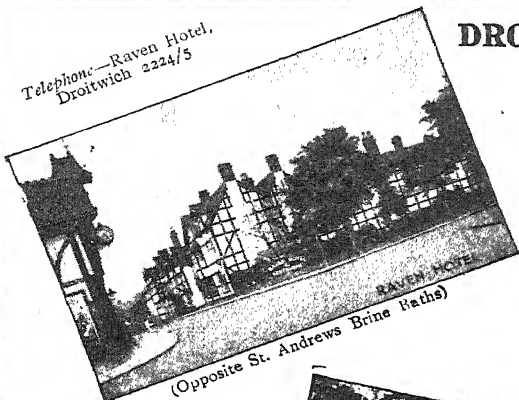
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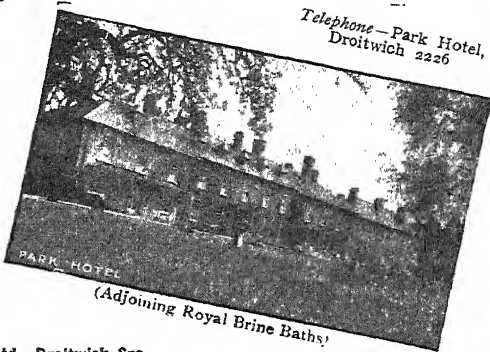
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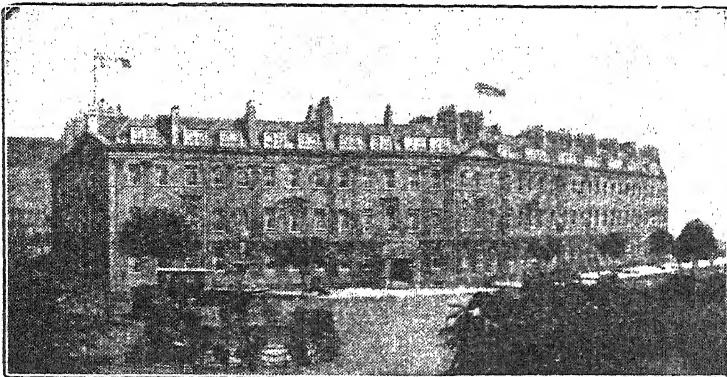
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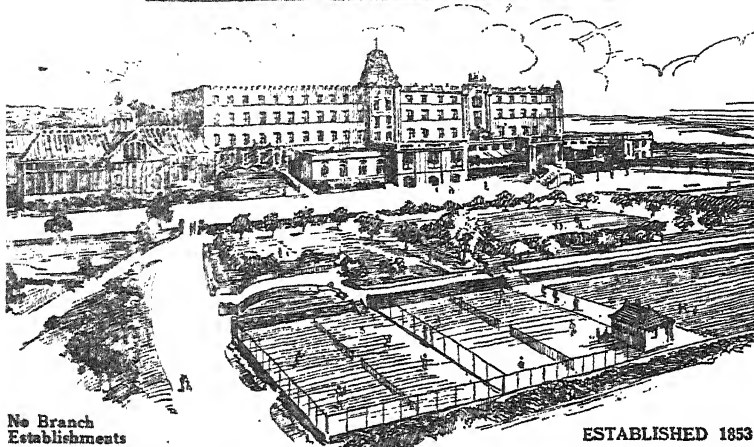
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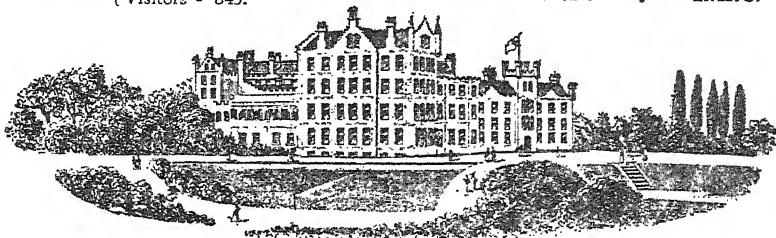
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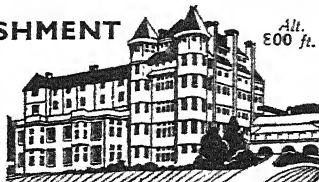
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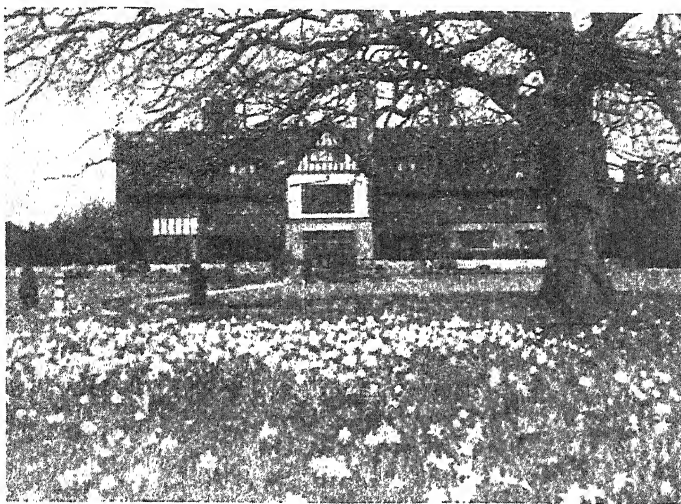
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Apply ROBINSON AND GARRATT, Resident Proprietors.



# EYHURST COURT

## KINGSWOOD, SURREY



### A Sanatorium for the Care and Treatment of Mental and Nervous Disorders

Eyhurst Court is situated 550 feet above sea-level on one of the most beautiful parts of the Surrey Hills. London is 17 miles distant. The mansion is equipped in the most modern manner and is tastefully furnished. There is central heating throughout and running hot and cold water in all bedroom. The grounds extend to over 36 acres and include pleasure gardens, hard and grass tennis courts, putting greens, and a small private golf course.

Voluntary and temporary patients of either sex are received. Fees range from 8½ guineas per week inclusive.

Prospectus and further details from:—

*The Resident Medical Officer,  
Eyhurst Court, Kingswood, Surrey*

*Telephone :  
Burgh Heath 1200-1*

# BETHLEM ROYAL HOSPITAL

Monks Orchard, Eden Park

Beckenham, KENT

For the Reception and Treatment of Cases of  
**NERVOUS AND MENTAL DISEASE**

*President*—VISCOUNT WAKEFIELD OF HYTHE, C.B.E., LL.D.

*Treasurer*—Sir LIONEL FAUDEL-PHILLIPS, Bt.

*Physician Superintendent*—J. G. PORTER PHILLIPS, M.D., F.R.C.P.

*Senior Assistant Physician*—JOHN G. HAMILTON, M.D., D.P.M.

*Junior Assistant Physician*—DAVID ROBERTSON, M.D.

*Pathologist*—CLEMENT LOVELL, M.C., M.D.

## CONSULTING STAFF

*Surgeon*—STANFORD CADE, F.R.C.S.

*Gynaecologist*—JOHN W. BELL, L.R.C.P.I., L.R.C.S.I.

*Ophthalmologist*—J. D. MAGOR CARDELL, M.B., F.R.C.S.

*Laryngologist*—W. MAYHEW MOLLISON, F.R.C.S.

*Anaesthetist*—CECIL M. HUGHES, M.B., B.S.

*Dental Surgeon*—ARTHUR BULLEID, M.R.C.S., L.D.S.

*Neurologist*—C. C. WORSTER-DROUGHT, M.A., M.D., M.R.C.P.

*Radiologist*—J. B. DOUGLAS, M.B., B.Ch., D.M.R.E.

*Director of Psychological Dept.*—WILLIAM BROWN, M.A., M.D., D.Sc., F.R.C.P.

*Assistant Ditto*—R. J. BARTLETT, M.Sc.

*Director of Physiotherapy Dept.*—ALASTAIR MACGREGOR, M.B., C.M.

Patients of the educated classes, in a presumably curable condition, are eligible for admission, and those who can contribute 5 guineas weekly towards the cost of treatment and maintenance may be received as vacancies arise. The Committee will also consider applications for admission at lower rates and in certain cases will be prepared to admit patients free of charge. With a view to the early treatment of eligible cases  
Voluntary or Uncertified Patients are admitted.

*For forms or further particulars apply to the Physician Superintendent.*

# CHISWICK HOUSE

PINNER, Middlesex

Telephone :  
PINNER 234

A Private Mental Hospital for the Treatment  
and Care of Mental and Nervous Disorders  
in both Sexes

A Modern Country House, 12 miles from Marble Arch, in beautiful and secluded grounds.

Certified, Temporary, and Voluntary Patients. Terms are from ten guineas a week, inclusive.



*Lately removed from  
Chiswick House, Chiswick.*

DOUGLAS MACAULAY,  
M.D., D.P.M.

# LAVERSTOCK HOUSE

SALISBURY, WILTSHIRE.

**A**N Old-established Private Home for the care and treatment of mentally afflicted Ladies and Gentlemen. Situated one mile from Salisbury. Stands in beautifully timbered pleasure grounds. Surroundings bright, cheerful and pleasant. Every form of recreation and outdoor amusement provided. Patients requiring only slight supervision can be accommodated in separate villas in the grounds.

Voluntary Boarders are received without certificates.

Railway Stations	-	-	-	G.W.R. and Southern
Telegrams	-	-	-	"Benson, Laverstock," Salisbury
Telephone	-	-	-	Salisbury 12

FOR FURTHER PARTICULARS, APPLY TO THE  
MEDICAL SUPERINTENDENT.

# ST. ANDREW'S HOSPITAL

## *For Mental Disorders*

## NORTHAMPTON

FOR THE UPPER AND  
MIDDLE CLASSES ONLY.

*President :* The Most Hon. the  
MARQUESS OF EXETER, C.M.G., A.D.C.

*Medical Superintendent :* DANIEL F. RAMBAUT, M.A., M.D.

THIS Registered Hospital is situated in 120 acres of park and pleasure grounds. Voluntary Patients who are suffering from incipient Mental Disorders, or who wish to prevent recurrent attacks of Mental trouble; Temporary Patients, and Certified Patients of both sexes, are received for Treatment. Careful clinical, biochemical, bacteriological, and pathological examinations. Private rooms with special nurses, male or female, in the Hospital or in one of the numerous villas in the grounds of the various branches can be provided.

### WANTAGE HOUSE.

This is a Reception Hospital, in detached grounds with a separate entrance, to which patients can be admitted. It is equipped with all the apparatus for the most modern treatment of Mental and Nervous Disorders. It contains special departments for hydrotherapy by various methods, including Turkish and Russian baths, the prolonged immersion bath, Vichy Douche, Scotch Douche, Electrical baths, Plombières treatment, etc. There is an Operating Theatre, a Dental Surgery, an X-ray Room, an Ultra-violet Apparatus, and a Department for Diathermy and High Frequency treatment. It also contains Laboratories for biochemical, bacteriological, and pathological research.

### MOULTON PARK.

Two miles from the Main Hospital there are several branch establishments and villas situated in a park and farm of 650 acres. Milk, meat, fruit, and vegetables are supplied to the Hospital from the farm, gardens and orchards of Moulton Park. Occupation therapy is a feature of this branch, and patients are given every facility for occupying themselves in farming, gardening, and fruit growing.

### BRYN-Y-NEUADD HALL.

The Seaside House of St. Andrew's Hospital is beautifully situated in a Park of 330 acres, at Llanfairfechan, amidst the finest scenery in North Wales. On the North-West side of the Estate a mile of sea coast forms the boundary. Patients may visit this branch for a short seaside change or for longer periods. The Hospital has its own private bathing house on the seashore. There is trout-fishing in the park.

At all the branches of the Hospital there are cricket grounds, football and hockey grounds, lawn tennis courts (grass and hard court), croquet grounds, golf courses, and bowling greens. Ladies and gentlemen have their own gardens, and facilities are provided for handicrafts such as carpentry, etc.

For terms and further particulars apply to the MEDICAL SUPERINTENDENT (Telephone Nos. 2356 & 2357 Northampton), who can be seen in London by appointment.

# NORTHUMBERLAND HOUSE

GREEN LANES, FINSBURY PARK, N.4.

Telephone : STAMFORD HILL 2688. Telegraphic Address : " SUBSIDIARY, LONDON."

*A Home for the Treatment of Patients of  
both sexes suffering from Mental Illnesses*

Conveniently situated four miles from Charing Cross.  
Nearest stations : Manor House (Piccadilly Underground), and  
Finsbury Park (G.N. Railway). Cars and Buses pass the Gate.

Six acres of Ground, highly situated, facing Finsbury Park.

*Private Villas.*

*Suites of Rooms.*

Convalescent Home : Kearsney Court, Dover.

Voluntary Patients received without certificates.

Terms from 5 Guineas per week.

For further particulars apply to the Medical Superintendent

# ST. PATRICK'S HOSPITAL, DUBLIN.

**For the treatment of Nervous and Mental Diseases.**

FOUNDED BY JONATHAN SWIFT, D.D., 1745.

THIS historic Institution, the first of its kind in Ireland, has been completely modernized and considerably enlarged. It affords every facility for the treatment of ladies and gentlemen suffering from nervous and mental diseases.

There are branch establishments situated at St. Edmondsbury, Lucan, within a beautifully wooded demesne of about 400 acres. A portion of the demesne is worked as a home farm, from which daily supplies of milk, mutton, poultry and vegetables, etc., are delivered to the three hospitals by means of a motor van. Extensive gardens and recreation grounds. Frequent drives by motor.

## MEDICAL STAFF :

<i>Medical Superintendent</i>	-	RICHARD R. LEEPER, F.R.C.S.I.
<i>Assistant</i>	-	ROBERT THOMPSON, M.B., D.P.M.
<i>Medical Officers</i>	-	ROBERT TAYLOR, L.R.C.P. and S.I., D.P.M.
	-	ALAN E. WARREN, L.R.C.P. & S.I., L.M.
<i>Clinical Pathologist</i>	-	ROBERT H. MICKS, M.D., F.R.C.P.I.
<i>Dentist</i>	-	ALBERT F. CARBURY, L.D.S.I.

Rates of maintenance vary according to the nature of each case and the accommodation required.

For forms and further particulars apply to Mr. A. E. Coe, Registrar, St. Patrick's Hospital, James Street, Dublin; or, in case of urgency, to the Medical Superintendent.

Telephones : Dublin 21095. Lucan 21.

# **BETHEL HOSPITAL**

*For Mental and Nervous Disorders,*  
**NORWICH.**

ESTABLISHED A.D. 1713.

THIS Institution is a Registered Hospital, managed by a Board of Governors, who have no pecuniary interest in its success, but whose sole object is to promote the comfort and well-being of the Patients. The Hospital is arranged for both sexes.

Voluntary Patients are admitted without certificates.

CONSULTING PHYSICIAN:

SAMUEL J. BARTON, M.D.

RESIDENT MEDICAL SUPERINTENDENT:

SAVILLE J. FIELDING, M.B.

CLERK TO THE GOVERNORS:

BASSETT F. HORNOR, D.S.O., QUEEN STREET, NORWICH.

MATRON:

Miss E. C. S. WHYTE

APPLICATION FOR ADMISSION TO BE MADE TO THE  
Resident Medical Superintendent - **BETHEL HOSPITAL, NORWICH.**

# **THE COPPICE,**

**NOTTINGHAM.**

*Hospital for Mental Diseases.*

THIS Institution for the reception of **PRIVATE PATIENTS** of both sexes of the **Upper and Middle Classes** only, at moderate rates of payment, is beautifully situated in its own grounds about two miles from Nottingham, and from its singularly healthy and pleasant position, and the comfort of its internal arrangements, affords every facility for the **Relief and Cure** of those **Mentally Afflicted**. Divine Service is held in the Institution every Sunday by the Chaplain, who also visits the Patients. Carriage and motor exercise is provided.

*Voluntary and Temporary Patients admitted.*

Tel. No.  
64117.

FOR TERMS, ETC., APPLY TO  
**DR. HUNTER. Physician-Superintendent.**

# HAYDOCK LODGE

## NEWTON-LE-WILLOWS, LANCASHIRE

*Telegraphic Address: "STREET, ASHTON-IN-MAKERFIELD" (two words only)*

*Telephone: ASHTON-IN-MAKERFIELD 7311*

### A PRIVATE MENTAL HOSPITAL FOR THE TREATMENT OF NERVOUS & MENTAL DISORDERS EITHER TEMPORARILY, VOLUNTARILY OR UNDER CERTIFICATE

**H**AYDOCK LODGE is a large Country Mansion especially adapted for the Care and Treatment of Persons with Nervous and Mental Disorders, having been enlarged and rebuilt on plans sanctioned and approved by the Commissioners in Lunacy. It is charmingly situated in a healthy and retired neighbourhood, standing in its own well-timbered Park, Gardens, and Farm of 300 acres, with provision and facilities for Tennis, Cricket, Football, Bowls, Croquet and Golf.

Newton-le-Willows is a first-class station on the L. M. & S. Ry. (mid-way between Liverpool and Manchester), where conveyances are always to be had.

Motors are kept for the use of Patients, and those whose condition will allow, and whose friends desire it, spend some time annually at the sea-side. Voluntary Patients are received without Certificate, written application for admittance being all that is required. Patients are also admitted on a Temporary basis.

Haydock Lodge has also associated with it an establishment at **GRETA BANK** (for ladies only), in the Craven district of Yorkshire, near Ingleton.

TERMS, PROSPECTUS and INFORMATION may be obtained on application to the Medical Superintendent.

Consultations can be arranged by appointment.

*Resident Medical Licensee.....* } .....J. C. WOOTTON, L.R.C.P.Lond., M.R.C.S.Eng.  
*Medical Superintendent.....* }

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## The Old Manor, Salisbury

Telephone 51

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### A PRIVATE HOSPITAL FOR THE CARE AND TREATMENT OF THOSE OF BOTH SEXES SUFFERING FROM MENTAL DISORDERS.

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Extensive grounds. Detached Villas. Chapel. Garden and dairy produce from own farm. Terms very moderate.

### Convalescent Home at Bournemouth

standing in 12 acres of Ornamental Grounds, with Tennis Courts, etc. Patients or Boarders may visit the above, by arrangement, for long or short periods.

*Illustrated Brochure on application to the Med. Supt., The Old Manor, Ltd., Salisbury.*

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## CLARENCE LODGE

55, CLARENCE ROAD, CLAPHAM PARK, S.W.4.

**A** LIMITED number of **LADIES** suffering from **MENTAL** and **NERVOUS DISORDERS** are received for treatment under a Specialist. The House stands in large grounds. Moderate Terms. **Telephone: Tulse Hill 4913.**

For further particulars see *Illustrated Prospectus from Resident Licensee: Miss THWAITES*

# HOLLOWAY SANATORIUM

## VIRGINIA WATER

---

*A REGISTERED HOSPITAL for the  
Treatment of MENTAL DISORDERS  
of the EDUCATED CLASSES.*

---

THIS Institution is situated in a beautiful and healthy locality within easy reach of London. It is fitted with every comfort. Patients can have Private Rooms and Special Nurses, as well as the use of General Sitting Rooms, at moderate rates of payment. Voluntary Patients can be admitted.

There is a BRANCH ESTABLISHMENT at CANFORD CLIFFS, BOURNEMOUTH, where Patients can be sent for a change and provided with all the comforts of a well-appointed home.

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*For Terms, apply to Dr. H. Devine, RES. MEDICAL SUPERINTENDENT,  
St. Ann's Heath, Virginia Water, SURREY.*

---

# HEIGHAM HALL

## NORWICH.

Telephone :  
Norwich 80.

Telegrams :  
"Small, 80 Norwich."

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**Private Home for the Care and Treatment of a limited number of  
Ladies and Gentlemen suffering from Nervous and Mental Illness.**

---

ABOUT two and a half hours from London by express train, and good connections with the Midlands.

The mansion, surrounded by 11 acres of well-wooded grounds, is furnished as a private residence, and nothing suggests confinement, the safety of patients being ensured by a large staff of experienced nurses. Any modern therapeutic measures can be undertaken in suitable cases. Private Suites of Rooms with special nursing available.

Seaside quarters are available when desired, and all amusements conducive to recovery are provided.

The Chaplain conducts Service every Sunday, and patients attend the Parish Church.

Voluntary patients, temporary patients, and patients under certificates are admitted for treatment.

FEES: from 4 guineas a week upwards according to requirements. Vacancies occasionally exist at reduced rates for ladies and gentlemen on the recommendation of the patient's own physician.

*Apply Dr. J. A. SMALL.*



# THE WARNEFORD

## HEADINGTON HILL, OXFORD.

**A Registered Hospital for the Care & Treatment of  
both Sexes of the Upper and Middle Classes, when  
suffering from Nervous and Mental Disorders. . .**

*President*—THE RIGHT HON. THE LORD SAYE AND SELE.

*Chairman of the Committee*—

THE VERY REV. THE DEAN OF CHRIST CHURCH.

*Vice-Chairman*—

D. S. MARGOLIOUTH, Esq., D.Litt., F.B.A., Fellow of New College.

THIS HOSPITAL is pleasantly situated on Headington Hill, on the outskirts of the City of Oxford. The grounds, which extend to over 120 acres, command extensive views of the surrounding country.

The buildings are arranged, so far as is compatible with the requirements of a Mental Hospital, in the manner of an ordinary private residence.

**TEMPORARY PATIENTS AND VOLUNTARY PATIENTS ARE RECEIVED.**

*For Terms and further particulars, apply to the—*

*Telephone—*

Physician Superintendent, ALEX. W. NEILL, M.D. 2083 OXFORD.

# CHEADLE ROYAL

## CHEADLE, CHESHIRE.

**A Registered Hospital for MENTAL DISEASES,  
and its Seaside Branch, GLAN-Y-DON, Colwyn Bay, N. Wales.**

THE object of this Hospital is to provide the most efficient means for the treatment and care of those of the Upper and Middle Classes suffering from MENTAL and NERVOUS DISEASES. The Hospital is governed by a Committee appointed by the Trustees of the Manchester Royal Infirmary.

**VOLUNTARY, TEMPORARY and CERTIFIED PATIENTS RECEIVED.**

**For Terms and further information apply to the MEDICAL SUPERINTENDENT.**

*Telephone - Gatley 2231.*

# Littleton Hall, Brentwood

— ESSEX —

A limited number of Ladies received, with or without certificate. Large grounds. 18 miles from London. 1 mile from station. Full particulars from DR. HAYNES. *Telephone: Brentwood 45.*

# DERBY MENTAL HOSPITAL

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## ALBANY HOUSE, a Detached Block for FEMALE PRIVATE PATIENTS.

---

TERMS: 2 GUINEAS PER WEEK and upwards. This Villa is distinct from the main building, and has separate recreation grounds.

*For further particulars, apply to the Medical Superintendent,*  
Tel. No.: DERBY 93. DR. JOHN BAIN, ROWDITCH, DERBY.

---

## THE GRANGE, Near Rotherham

A SANATORIUM OF THE HIGHEST CLASS FOR THE  
CARE & CURE OF MENTAL INVALIDS (Ladies).

Resident Physician: G. E. MOULD, M.R.C.S. Eng., L.R.C.P. Lond.,  
*Consulting Physician for Mental Diseases to the Sheffield Royal Hospital.*

THE House is a spacious Family Mansion, with extensive pleasure grounds, including good Croquet and Tennis Grounds, and an immense Park, containing Private Drives and Walks of several miles in extent. It is situated in the heart of the famous Robin Hood Country (5 miles from Sheffield, 4 from Rotherham) and is surrounded by beautiful scenery, and an atmosphere free from smoke and impurity. Situation dry and healthy. The arrangements are of a domestic character. The Proprietors welcome visits from the usual Medical Attendant of the Patient during her residence. Certified Voluntary and Temporary Patients received. The Rev. R. T. C. Slade, Mus. Bac., late Vicar of Thorpe-Hesley, acts as Chaplain, and conducts regular Services.

The Resident Physician may be seen at the Grange; or at 342 Glossop Road, Sheffield, by appointment. Telephone: Sheffield No. 48030.

GRANGE LANE STATION (L. & N.E. Railway) is within a quarter of a mile of the Grange, and may be reached via Sheffield or Barnsley direct; or via Rotherham, changing at Tinsley.

FOR TERMS, FORMS, &c., APPLY TO THE RESIDENT PHYSICIAN.

---

## Shaftesbury House,

### FORMBY-BY-THE-SEA.

Telephone: No. 8 FORMBY.

Near LIVERPOOL.

THIS HOUSE, specially built and licensed for the Care and Treatment of a limited number of LADIES and GENTLEMEN suffering from  
**MENTAL or NERVOUS BREAKDOWN,**

is delightfully situated between Liverpool and Southport in well-wooded grounds. Outdoor and indoor amusements and occupation provided. Voluntary and Certified Patients received. Ladies also admitted as Temporary Patients without certification

TERMS MODERATE.

Apply RESIDENT PHYSICIAN.

# CAMBERWELL HOUSE

33, PECKHAM ROAD, LONDON, S.E.5

Telegrams :  
"Psycholia, London"

For the Treatment of  
**MENTAL DISORDERS**

Telephone :  
Rodney 4731-2

**A**LSO completely Detached Villas for mild cases with private suites if desired. Voluntary patients received. Twenty acres of grounds, Hard and Grass Tennis Courts, Putting Greens, Bowls, Croquet, Squash Racquets, and all indoor amusements including Wireless, and other Concerts. Occupational Therapy, Callisthenics and Dancing Classes. X-ray and Actino Therapy, Prolonged Immersion Baths, Operating Theatre, Pathological Laboratory, Dental Surgery and Ophthalmic Dept. Chapel.

**Senior Physician: Dr. HUBERT JAMES NORMAN,**  
assisted by three Medical Officers, also Resident, and visiting Consultants.  
Illustrated Prospectus, giving fees, which are strictly moderate, on application to the Secretary  
**The Convalescent Branch is HOVE VILLA, BRIGHTON, 200 ft. above sea level.**

# PECKHAM HOUSE

112, Peckham Road, LONDON, S.E. 15

Telegrams: "ALLEVIATED, LONDON" Telephone: Rodney 4741, 4742

**T**he above **MENTAL HOSPITAL** supplies suitable **CARE AND TREATMENT FOR PERSONS SUFFERING FROM NERVOUS DISEASES AND MENTAL DISORDERS.** Temporary, voluntary and certified patients are received. Separate houses for the treatment of suitable cases adjoin the Hospital. There is a seaside branch, Kearsney Court, near Dover. Motor and carriage drives are provided as desired. Up-to-date methods of treatment are employed and every effort is made by handicraft work, physical drill, games, entertainments, etc., to promote the speedy recovery of patients.

The terms are moderate, being from 3 gns. per week upwards.

Illustrated Prospectus and further particulars can be obtained from the **MEDICAL SUPT.**

Telephone: HOUNSLOW 0158.

# WYKE HOUSE

ISLEWORTH, MIDDLESEX.

**A Private  
Mental Hospital  
for Ladies and  
— Gentlemen.**

Conveniently situated in quiet surroundings in Syon Lane,  
about a quarter of a mile to the north of the Great West Road.

Stations: OSTERLEY (District Railway); SYON LANE (Southern Railway).

For Terms and Further Particulars apply to the Resident Physician:—

G. W. SMITH, O.B.E., M.B., Ch.B. (Edin.)

Consulting Rooms: 57 GROSVENOR STREET, W.1. (By Appointment).

# CITY OF LONDON MENTAL HOSPITAL,

Near DARTFORD, KENT.

Under the management of a Committee of the Corporation of the City of London.

**LADIES and GENTLEMEN** received for treatment under Certificates and without Certification, as either **Voluntary or Temporary Patients**, at a **WEEKLY FEE of TWO GUINEAS** and upwards. An Illustrated Booklet giving full particulars can be obtained from the **Medical Superintendent.**

The Institution is within two miles of Dartford Station, on the Southern Railway, with frequent electric train service, and is about 16 miles from London. Motor Omnibuses pass the door.

Telephone: DARTFORD 900, 901. Telegraphic Address: STONE HOUSE, DARTFORD, KENT.

# ASHWOOD HOUSE,

## KINGSWINFORD, STAFFORDSHIRE.

An old-established and modernized Institution for the Medical Treatment of Ladies and Gentlemen Mentally Afflicted.

THE House, pleasantly situated, stands in picturesque grounds of forty acres in extent, with a surrounding country noted for the beauty of its walks and drives. The climate is genial and bracing. Occupation, indoor and outdoor amusements, and carriage and other exercise amply provided.

TERMS vary according to requirements as to accommodation, special attendance, etc.

TELEPHONE 19, KINGSWINFORD.

Railway Stations: Stourbridge Junction (G.W.R.),  $3\frac{1}{2}$  miles; Dudley (L.M. & S.R.), 4 miles; Wolverhampton (G.W.R. or L.M. & S.R.), 7 miles.

FOR FURTHER PARTICULARS APPLY TO THE MEDICAL SUPERINTENDENT.

# FARNHAM HOUSE & MARYVILLE

## FINGLAS, Co. DUBLIN.

PRIVATE HOSPITALS for MENTAL AND NERVOUS ILLNESS, including the ALLIED DISORDERS OF ALCOHOLISM and THE DRUG HABIT.

IDEALLY situated within two miles of the City and in a health-inducing district. Voluntary boarders received without medical certificates.

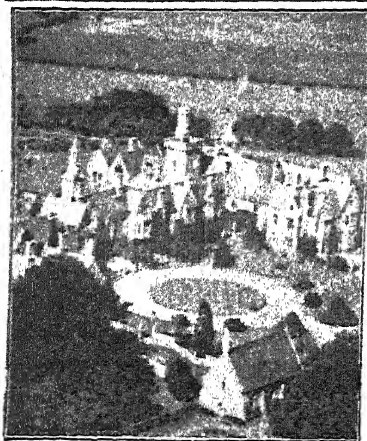
A beautiful seaside residence in a park of 600 acres, with a private bathing beach, is available for suitable cases.

Experienced staff; modern treatment. Interviews can be arranged at 42, FITZWILLIAM PLACE, DUBLIN.

Apply: H. R. C. RUTHERFORD, F.R.C.S.I., D.P.H.,

PHONE: FINGLAS 11.

*Medical Superintendent.*



# COTON HILL

## Mental Hospital

Near STAFFORD.

*Chairman of the Committee of Management:*

THE RIGHT HONOURABLE

THE EARL OF DARTMOUTH.

Beautifully situated in a high and healthy position, with extensive grounds. The hospital is devoted to the care and treatment of the mentally afflicted of the upper and middle classes. Voluntary patients are received. Terms on application. Private rooms with special attendants, can be arranged.

*For further particulars, apply to—*

Dr. R. MACDONALD, O.B.E., M.D., D.P.M.

Telephone: Stafford 14.

# SPRINGFIELD HOUSE

## Near BEDFORD

Telephone No. 3417

**For Mental Cases, with or without Certificates**

*Ordinary Terms, Five Guineas per week*  
(including Separate Bedrooms for all suitable Cases, without extra charge). :: ::

For forms of admission, etc., apply to the Resident Physician, CEDRIC W. BOWER, as above, or at 5, DUCHESS STREET, PORTLAND PLACE, W.1, on Tuesdays, from 4 p.m. to 5 p.m., by appointment.

# HILL END HOSPITAL

## For Mental and Nervous Disorders

(TWENTY MILES FROM LONDON)

LADIES suffering from all forms of MENTAL ILLNESS are received for treatment, on modern lines, as Voluntary, Temporary, or Certified Private Patients at the Hill End Hospital. Convalescent or Mild Cases can be treated in a delightful Country Mansion, with extensive grounds, known as

**HIGHFIELD HALL**, situate about a mile away from the Hospital.

**FEES** - 2 to 3 guineas per week.

For further particulars apply to the Medical Superintendent :  
W. J. T. KIMBER, L.R.C.P., D.P.M. - ST. ALBANS, Herts.

# THE GROVE HOUSE

**CHURCH STRETTON, SHROPSHIRE**

A PRIVATE HOME for the Cure and Treatment of a limited number of Ladies Mentally Afflicted. Voluntary and Temporary Patients received under the new Mental Treatment Act of 1930.

**CLIMATE HEALTHY AND BRACING**

Apply to the Resident Medical Superintendent, Dr. McCLINTOCK

# STRETTON HOUSE

**CHURCH STRETTON, SHROPSHIRE.**

A PRIVATE HOME for the treatment of gentlemen suffering from Mental and Nervous illness, including the allied Disorders of Alcoholism and the Drug Habit. All types of early Mental and Nervous Cases are received without certificates as Voluntary Patients. Bracing hill country.

Apply to MEDICAL SUPERINTENDENT.

'Phone 10 P.O. Church Stretton.

# BARNWOOD HOUSE

## GLOUCESTER

**A REGISTERED HOSPITAL for the CARE and TREATMENT of LADIES and GENTLEMEN suffering from NERVOUS and MENTAL DISORDERS.**

**W**ITHIN two miles of the G.W.R. and L.M. & S. Railway Stations at Gloucester, the Hospital is easily accessible by Rail from London and all parts of the United Kingdom. It is beautifully situated at the foot of the Cotswold Hills, and stands in its own grounds of over 280 acres. Voluntary Patients of both sexes are also received for Treatment.

Special accommodation for **LADY VOLUNTARY PATIENTS** is also provided at the **MANOR HOUSE**, which has its own private grounds and is entirely separate from the main Hospital.

*For particulars as to Terms, etc., apply to* **ARTHUR TOWNSEND, M.D.,**

Telephone: No. 6297 BARNWOOD.

*Resident Superintendent.*

# THE FLOWER HOUSE

## BECKENHAM LANE, S.E.6

Telephone: LITTLER GREEN 1908

8 miles from London.

A PRIVATE HOME of the highest class for *Gentlemen* suffering from Mental and Nervous Disorders, both under certificates or as *Voluntary Patients*.

A beautifully furnished old Family Mansion, thoroughly modernized and up to date.

Twenty five acres of well-timbered grounds, containing unrivalled flower gardens, cricket and football fields, croquet, tennis and bowls.

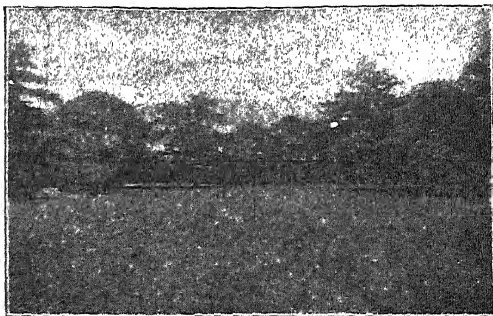
Billiards room, Wireless, Concerts and Sports.

Special suites for suitable patients, in new annex, consisting of private sitting room, bed room, attendant's room (if necessary) and private bath room and lavatory.

Station, BECKENHAM HILL, 8 minutes, and Beckenham Junct.

Tram 54 from Victoria to Southend Village, which is 2 minutes' walk from Flower House.

Motor Buses 54, 47, 582.



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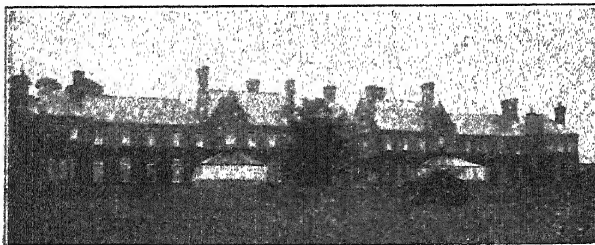
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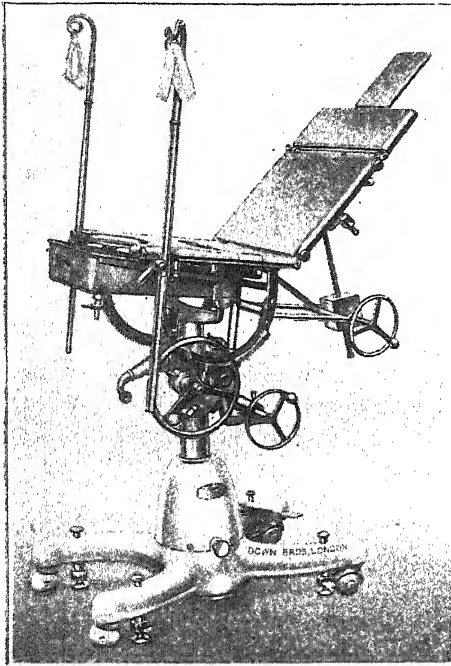
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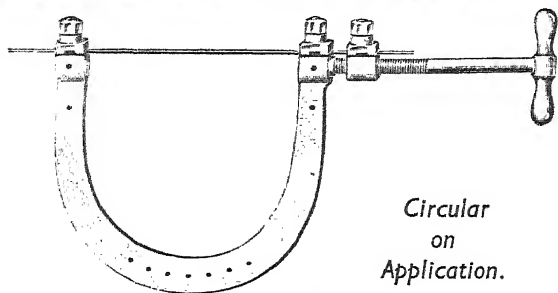
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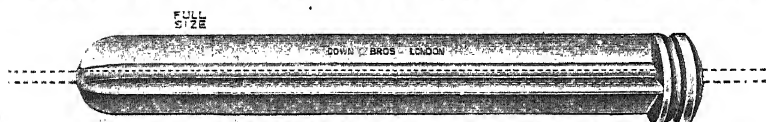
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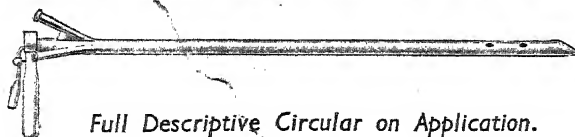
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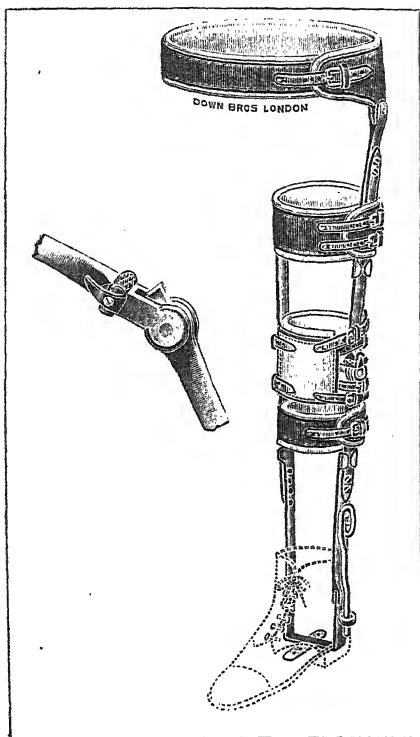
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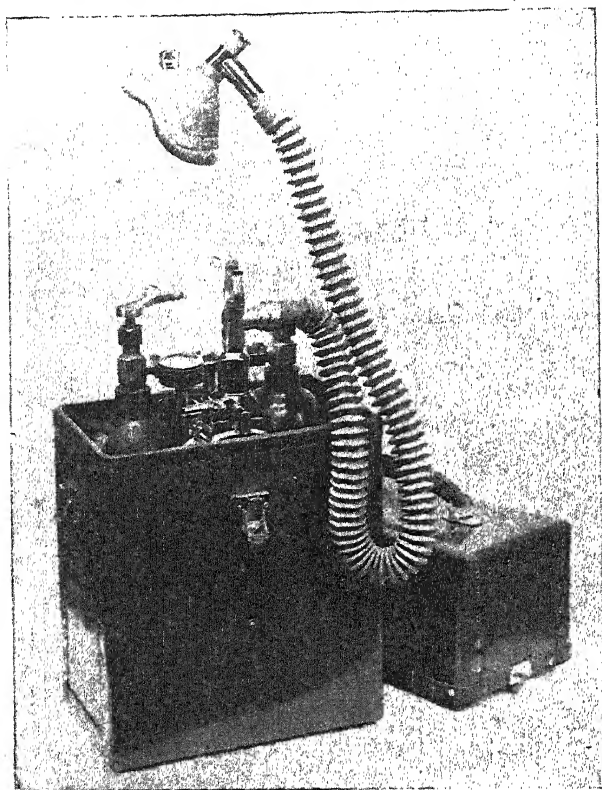
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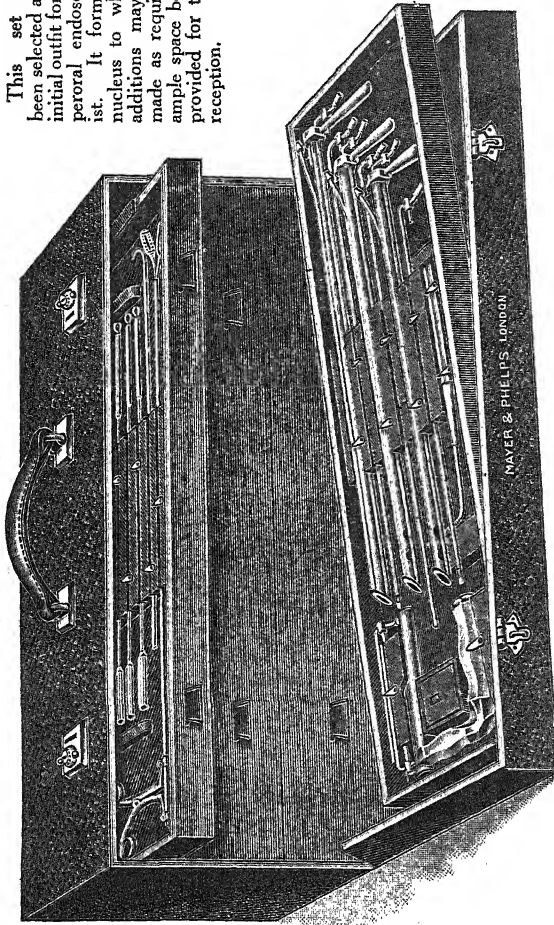
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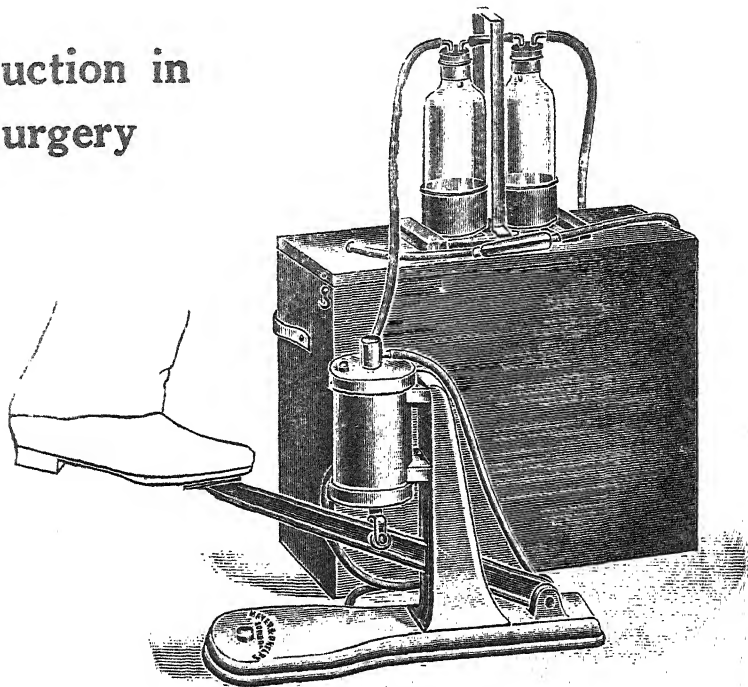
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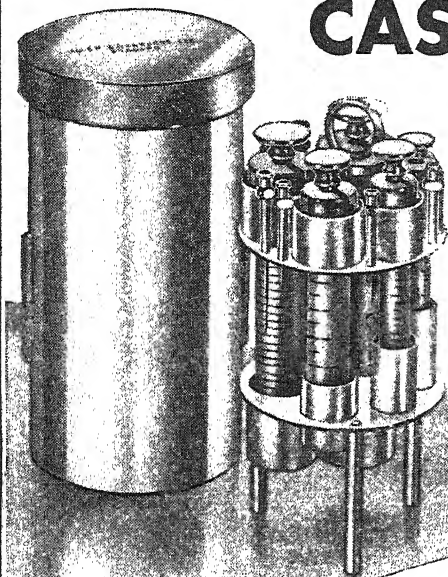
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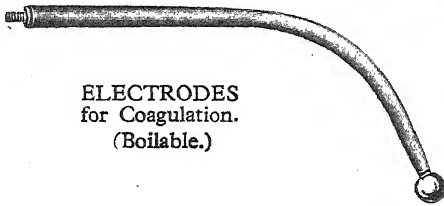
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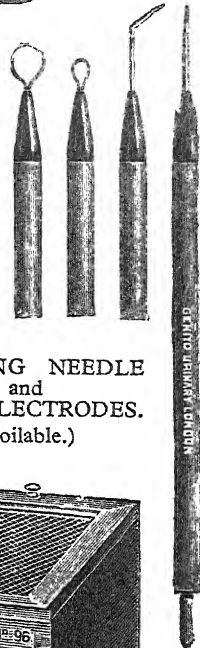
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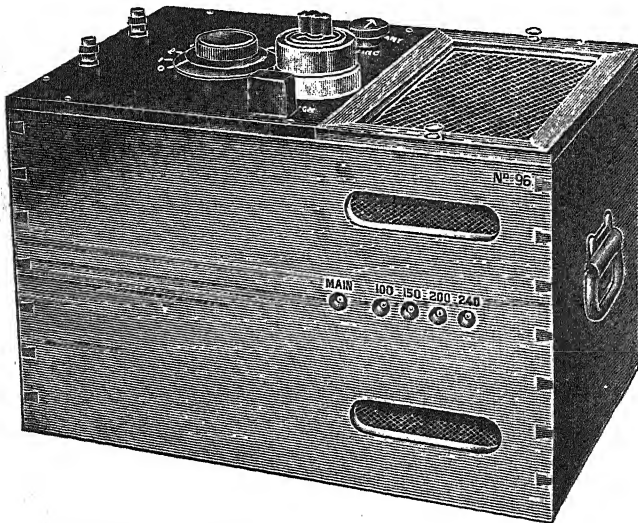




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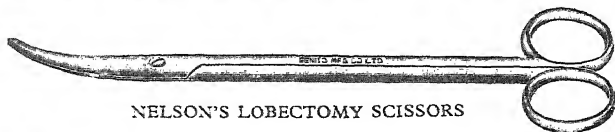
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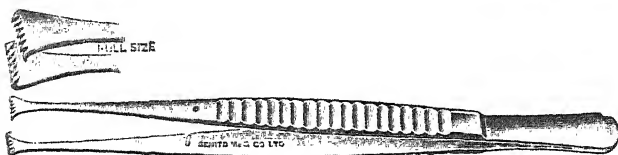
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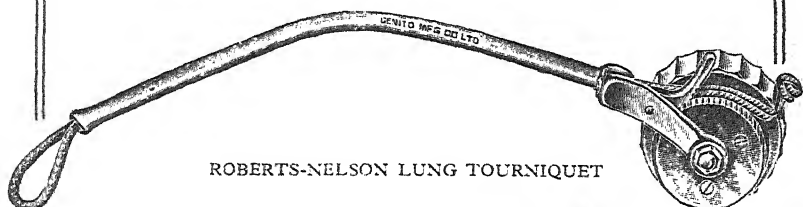
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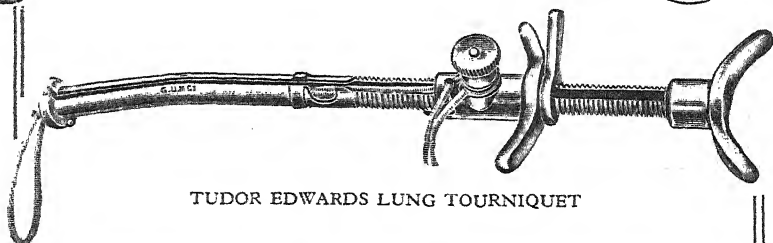
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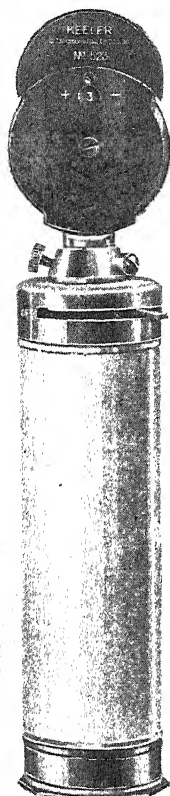
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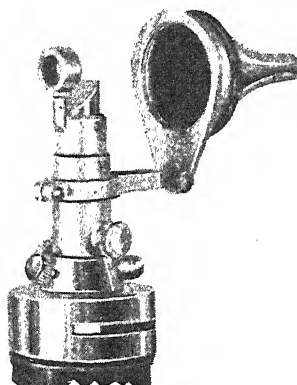
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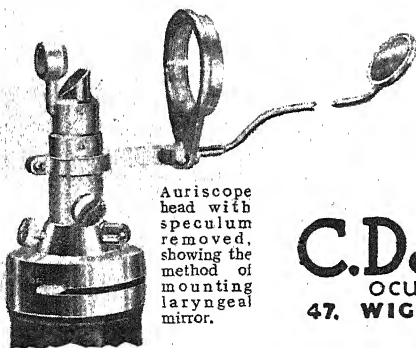
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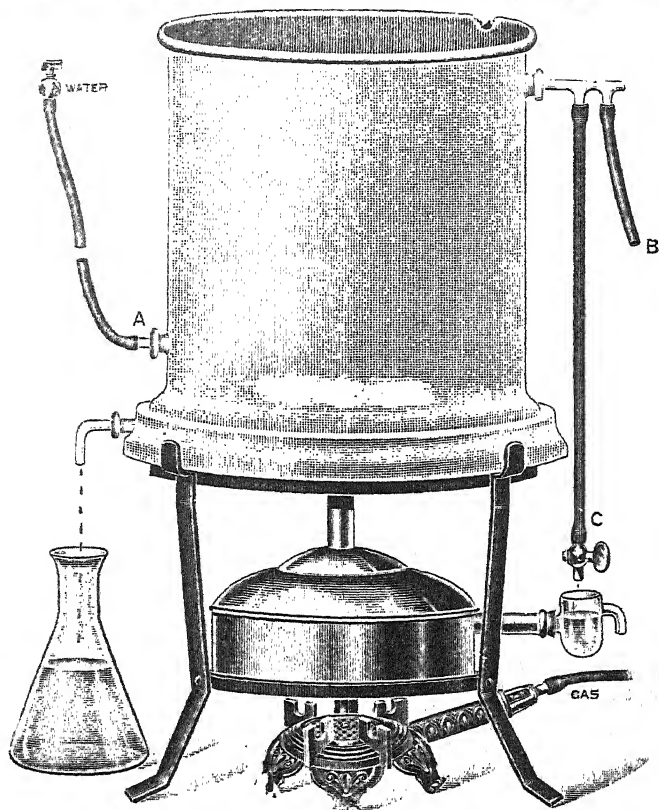
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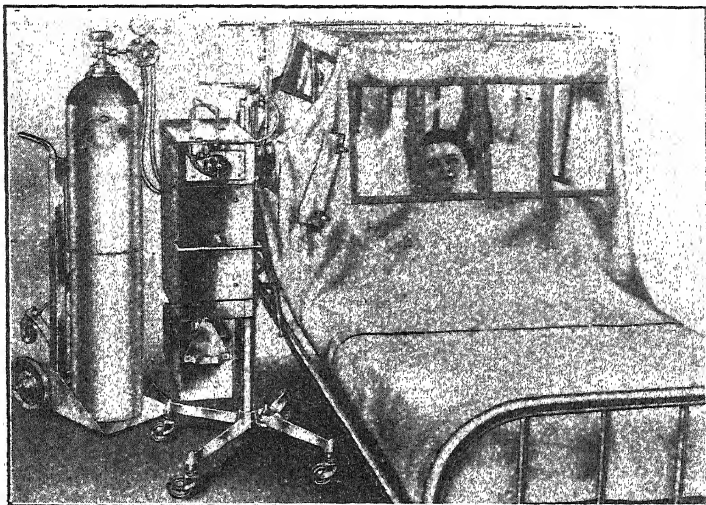
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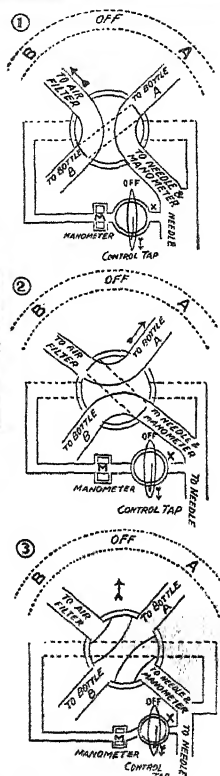
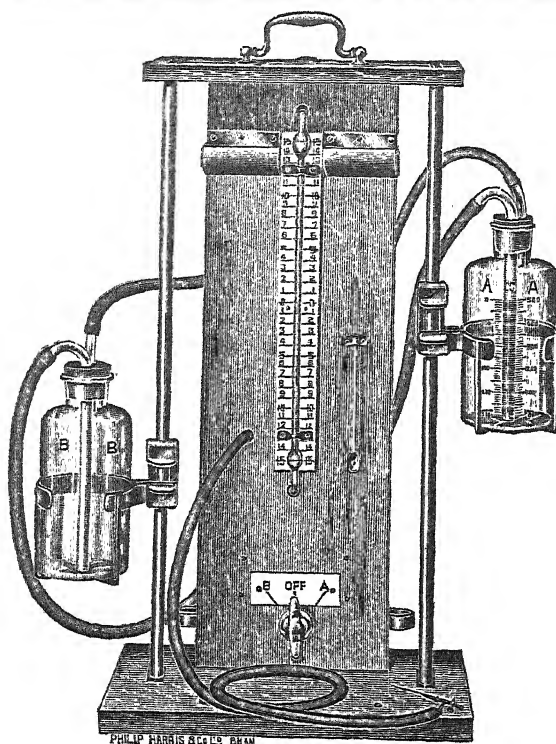
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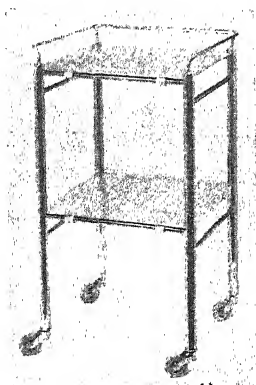
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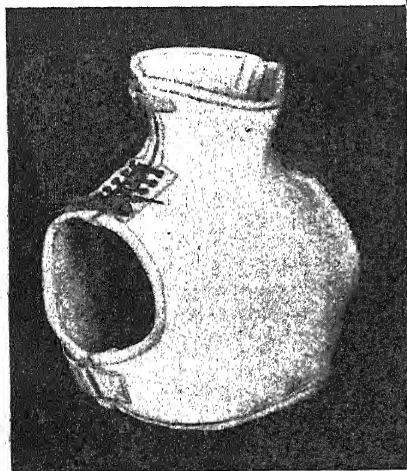
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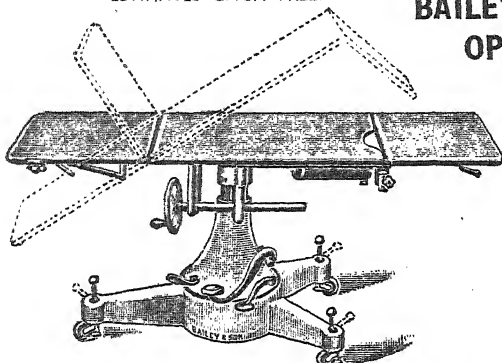
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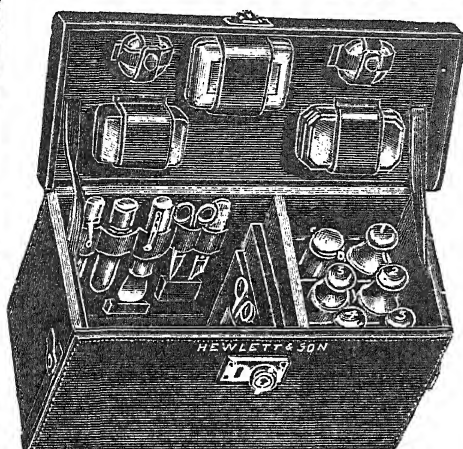
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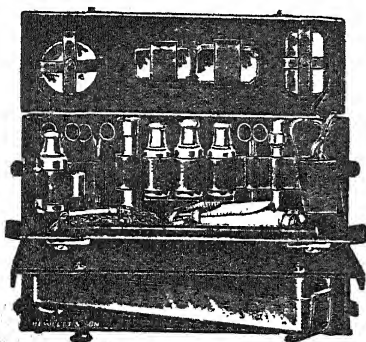
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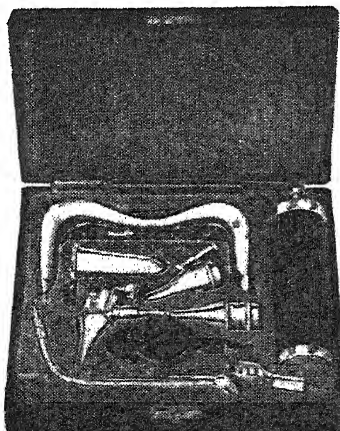
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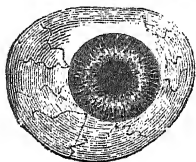
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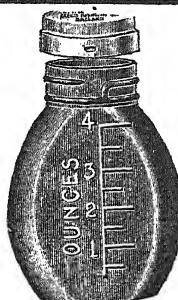
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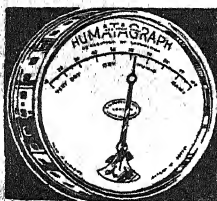
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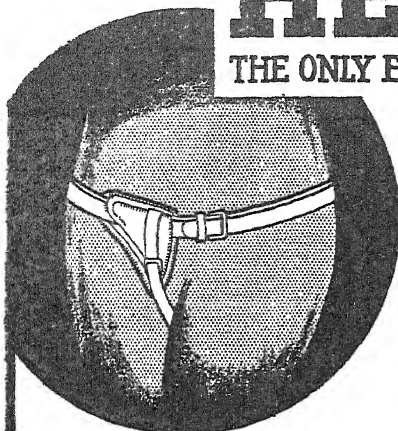
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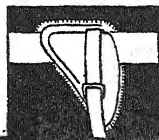
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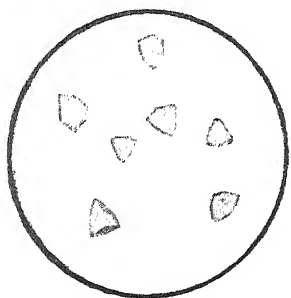
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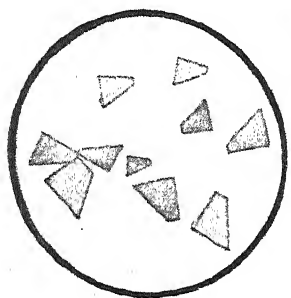
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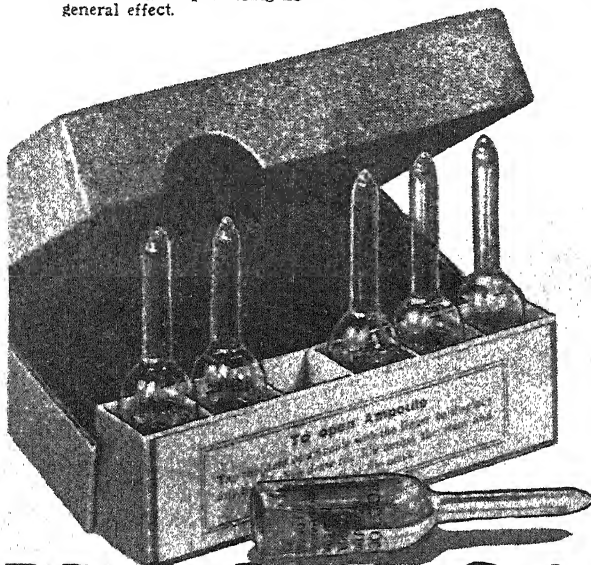
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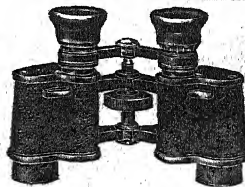


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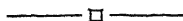
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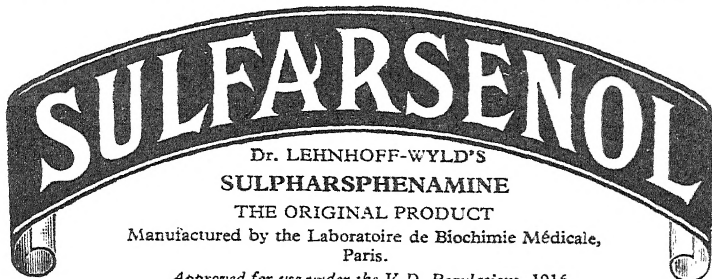
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